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181. Msg (C/Gp4) Cite SSH-1-6-4, 1 Jun 62.

182. Msg Cite SSH-2-6-7, 2 Jun 62 (S/Gp4).

183. SSD (SSH) Ltr to AFPRO (Col Voyles), Lockheed, subj: AFPR Surveillance of -68 Contract Spares Procurement, 4 Jun 62.

184. Msg from DCMSF to SSD, info MSFC, Cite MSFA 12-6-23, 121408Z Jun 62.

185. Ltr (Uncl w/o S/Gp3 Atch), subj: Request for Information by the Space Technical Objectives Task Group, 13 Jun 62, w/1 Atch: 648B Summary

186. Msg (C/Gp4) from Douglas Aircraft Co Inc, 151442Z Jun 62.

187. MFR, subj: Component Improvement Briefing to MajGen Ritland and Dr. Charyk, 25 Jun 62.

188. MFR (C/Gp4) from MSFA, subj: Agena D. Presentation, 25 Jun 62, 27 Jun 62.

189. MFR, subj: Agena D Funding, 28 Jun 62.

190. Msg, Cite MSFA 28-6-61, 281813Z Jun 62

191. SSD (SSRDA) Ltr (C/Gp4) to multiple address, subj: Agena D Optional Equipment Weight Status, 3 Jul 62.

192. SSD (SSVZO) Ltr to SSHAG, subj: Conversion of AMR Complex 14 to an Atlas/Agena Configuration, 5 Jul 62.

193. SSD (SSH) Ltr to multiple address, subj: Agena D Configuration Control, 9 Jul 62.

194. SSD (SSH ltr to multiple address, subj: Configuration Control of Agena D, 11 Jul 62.

195. CCN Status Contract AF 04(695)-21 As Of 12 July 1962.

196. SSD (SSZDB Ltr to BSRGT and SSVX, subj: Program Designation Change, 12 Jul 62.

197. SSD (SSH) Ltr (C/Gp4) to SSG-1 (Col Wicklund), subj: International Programs, 12 Jul 62.

198. SSD (SSH)Ltr to AFSC (SCGH Col Nudenberg), subj: 648B Monthly Program Progress and Status Report Period Ending 30 June 1962, 13 Jul 62.

199. SSD (SSH) Ltr to SSKR (Mr. Montgomery), subj: Preliminary Impact Evaluation of Impending Aerospace Industry Strike on SSD Programs (Reports Control Symbol (RCS) AF-XDL-H2, w/1 Atch: Report.

200. SSD (SSHAA-2 ltr to 6593 Test Group, subj: LR81 Rocket Engine, 20 Jul 62.

201. SSD (SSHAA) Ltr to Lockheed, subj: Agena Multiple Start Engine Compatibility with DOD Missions, 25 Jul 62.

202. SSD (SSHR) Ltr to ASD, subj: Request for Type Designation, Agena D Vehicle, 26 Jul 62.

203. Msg from Douglas Aircraft Co Inc to Lockheed, 1 Aug 62.

204. SSD (SSHKK) to SSH, subj: AF 04(695)-194, Authority for Non-Competitive Negotiated Procurement, 1 Aug 62.

205. Msg from SSD to ARDC, cite SSH 2-8-1, 2 Aug 62.

206. SSD (SSHAA) Ltr to Lockheed, subj: Agena Rocket Engine Designations, 3 Aug 62.

206a. SSD (SSHOD) Ltr to AFMTC, Lockheed, subj: Requirement for Vehicle Transporter, 3 Aug 62.

207. SSD (SSH) Ltr to multiple address, subj: Technical Manuals for Agena B, 10 Aug 62.

208. SSD (SSHKK) Ltr to SSHR (Maj.Harnes), subj: Transfer of Agena D Program Management, 13 Aug 62.

209. Msg from SAFCI-3C Maj Moore for release 15 Aug 62.

210. SSD (SSHOD) Ltr to multiple address, subj: Auto-DRAPE Orientation, 16 Aug 62.

211. SSD (SSHAA) Ltr to Lockheed, subj: Establishment of Agena-D Prelaunch Conditions, 20 Aug 62.

212. SSD (SSHAA) Ltr to Lockheed, subj: Agena Multiple Start Engine Compatibility with DOD and NASA Program, 24 Aug 62.

213. Status Report on Agena D (Program S-01A) August 62.

214. Msg from SSD to Lockheed, Cite SSH 27-8-33, 27 Aug 62.

215. Memorandum of Agreement, subj: Management Relationships Between SSH-SSZI, SSZN, SSZK and LMSC, 5 Sep 62.

216. SSD (SSHKK) Ltr to multiple address, subj: Authorization for type of Contract; Contract AF 04(695)-198, 7 Sep 62, w/1 atch.

217. SSD (SSHR) Ltr to SSZ, subj: Agena D FY-63 Funding Requirements to Support SSZ Program Requirements, 11 Sep 62.

218. SSD (SSH) Ltr to SSVR, subj: Agena D FY-63 Funding Requirements to Support NASA Program Requirements, 11 Sep 62.

219. Msg from SSD to CSAF, Cite SSH-13-9-10, 13 Sep 62.

220. Msg from SSD to AFSC, Cite SSH-13-9-11, 13 Sep 62.

221. SSD (SSHAA) MFR to Capt George W. Watts, 17 Sep 62.

222. SSD (SSH) Ltr to Lockheed, subj: Production of Optional Kits under the -68 Contract, 24 Sep 62.

223. SSD (SSG) Ltr to Secy of the Air Force (SAFFM), subj: FY-62 and FY-63 Agena D Funding Requirements, 27 Sep 62 (S/Gp3).

224. SSD (SSH) Ltr to Lockheed, subj: First Article Configuration Inspection of S-01A/13, 17-19 Sep 62, 28 Sep 62.

225. Msg Cite SSH 28-9-33, 28 Sep 62.

226. Lockheed ltr to AFSSD (DCCA), subj: Management of the S-01A Program, 1 Oct 62, w/1 Atch: Program Management Paper.

227. 1st Ind (Uncl w/o C/Gp4 Atch), SSD to SSVSP, subj: Liquid Rocket Engine Date, 5 Oct 62, w/1 Atch: Engine Data Chart.

228. SSD (SSHCD) Ltr to Lockheed, subj: Ground Rules for Management of the AC-1 System, 8 Oct 62.

229. Msg, Cite SSH 12-10-23, 12 Oct 62.

230. SSD (SSH) Ltr to SSO, subj: Agena Presentation, 15 Oct 62.

231. Msg (C/Gp4), Cite SSH 15-10-20, 15 Oct 62.

232. 1st Ind, SSD (SSH) to SSVZR, subj: Agena D/Gemini Configuration," 16 Oct 62.

233. Memorandum to SSH (Col Fletcher), subj: S-01A Requirements Based on TAT Boosted Missions, 18 Oct 62.

234. SSD (SSH) Ltr to AFPRO (Col Voyles), Lockheed, subj: AFPR Logistics Surveillance of Program S-01A, 19 Oct 62.

235. SSD (SSHR) Ltr to SSVZR (MajAlbert), subj: Optional Equipment Requirements for S-01A Vehicles, 22 Oct 62.

236. SSD (SSH) Ltr to SSHK, subj: Sole Source Justification, Contract AF 04(695)-221, 22 Oct 62.

237. Msg, Cite SSH 23-10-37, 23 Oct 62.

238. SSD (SSHR) Ltr to SSO (Col Hedrick), subj: Agena D C&C Optional Equipment, 31 Oct 62.

239. SSD (SSHR) Ltr to SSVR, subj: Agena D FY-63 Funding Requirements to Support NASA, 1 Nov 62.

240. SSD (SSH) Ltr to Lockheed, subj: S-01A Vehicle Assignment Philosophy, 2 Nov 62.

241. SSD (SSH) Ltr to Lockheed, subj: Fixed Ullage Rocket Carrier Problem, 8 Nov 62.

242. SSD (SSHK) Ltr to multiple address, subj: Request for Authority to Extend Definitization Data and to Obligate Additional Funds - Letter Contract AF 04(695)-68, Agena D, 14 Nov 62.

243. SSD (SSZ) Ltr to SSVZ, subj: Proposed NASA/Air Force Management Agreement, 14 Nov 62.

244. SSD (SSHK) Ltr to multiple address, subj: Request Authorization for Letter Contract AF 04(695)-233, 16 Nov 62.

245. SSD (SSHD) Ltr to 6595 ATW (Col Perry), subj: Umbilical Test Philosophy and Blanket Removal for SLV3/S-01A/Payload FSV, 26 Nov 62.

246. Msg (C/Gp4), Cite AFSSV-KQ 98986, 302127Z Nov 62.

247. SSD (SSH) Ltr to Lockheed, subj: First Article Configuration Inspection of S-01A/19, 6-23 Nov 1962, 12 Dec 62.

248. Historical Data - Jul-Dec 1962 from SSZAR to SSZA, 24 Jan 63.

249. NASA Ltr to Gen B. A. Schriever, 25 Jan 63.

250. Contractor Performance Evaluation Report on AF Contract AF 04(695)-21, with Lockheed Missile and Space Company, Sunnyvale, California, 14 Feb 63, (C/Gp4).

251. Ltr sgd Gen B. A. Schriever to Dr. Robert C. Seamans, Jr., 6 Mar 63.

252. Space Systems Division USAF S-01A Management Package, 20 Mar 63 (S/Gp3).

253. Msg, Cite MSFA 16-4-35, 161700Z Apr 63.

254. SSD (SSV) Ltr to Distribution, subj: Letter of Understanding Between NASA Lewis Research Center and USAF Space Systems Division for Transfer of NASA Agena Contracts, 9 May 63.

255. SSD (SSZAC) Ltr to SSZH and SP-206, subj: Configuration Control Management of Program S-01A Booster Vehicles, 19 Jun 63 (S/Gp4).

256. Msg Cite AFRSTD 76993, undated, and Msg Cite MSFA 15-7-22, 152045Z Jul 63.

257. AFSC (MSFAR) Ltr to multiple address, subj: Transmittal of Memorandum of Agreement, 20 Aug 63, w/1 Atch: USAF-NASA Memorandum of Agreement NASA Office of Space Sciences Agena Launch Vehicle Program, 9 Aug 63.

258. SSD (SSVA) Ltr (C/Gp4) to SSV, subj: Annual Report of Achievements (3 Oct 1962 - 3 Oct 1963), 27 Sep 63.

259. DOD News Release No. 1396-63, 21 Oct 63.

260. Msg Cite MSFA 7-11-6, 071956Z Nov 63.

261. Summary Report - Transfer of NASA Agena Programs from AFSSD to NASA LeRC, 31 Dec 63.

262. SSD (SSV[illegible] Ltr to Hq [illegible], subj: [illegible] of [illegible] Agena Programs, 3 Jan 64.

263. SSD (SSVA) Ltr (Uncl w/o C/Gp4 Atch), subj: Historical Report: 1 Jul 1963-31 December 1963, 4 Feb 64, w/5 Atch.

264. SSD (SSVAC Ltr to SS[illegible] (Col [illegible]), subj: Erection of Thor-Agena in Front of Building A, 16 Apr 64.

265. SSD (SSVA) Ltr (C/Gp4) to SSEH, subj: Historical Report, 1 January 1964-30 June 1964, 12 Aug 64, w/5 Atch: 1 (U); 2 (C); 3 (U); 4 (C); 5 omitted; 6 (C).

266. SSD (SSG) Ltr (Uncl w/o C/Gp4 Atch) to AFSC ([illegible] MajGen Ritland), subj: Recent Agena Flight Problems, 12 Nov 64, w/1 atch: Proposed letter to Sec McMillan from Gen Schriever, w/1 atch.

267. SSD (SSG) Ltr (Uncl w/o C/Gp4 Atch) to AFSC (Gen Schriever, subj: General Dynamics/Astronautics Proposal to Increase SLV-3/Agena Payload Capability, 27 Nov 64, w/2 Atch; Atch 1 C/Gp4.

268. SSGA Memorandum for Generals Funk and Cooper (FCUO), subj: Request for Authority to Raise Major Agena Subcontractors to Associate Status, 10 Dec 64.

269. SSD (SSK) Ltr (C/Gp4) to AFSC and Hq USAF (in turn), subj: Request for Determination and Findings Pursuant to AFPI 3-214, 25 Jan 65.

270. SSD (SSVA) Ltr (C/Gp4) to SSEH, subj: Historical Report, 1 July 1964 - 31 December 1964, 5 Feb 65, w/5 Uncl Atch.

271. Gemini Atlas Agena Target Vehicle System, Management and Responsibilities Agreement between the National Aeronautics and Space Administration Manned Spacecraft Center and The United States Air Force Air Force Systems Command, Space Systems Division, Mar 65.

272. SSD (SSGA) MFR, subj: Biosatellite Program -- Call from Cols Pickering and Swan of AMD, 9 Mar 65.

273. Memorandum for Gen Funk, Thru Gen Cooper, from Col Hamilton, subj: Advanced Life Support Capsule, 2 Apr 65.

274. SSD (SSK) Ltr (C/Gp4) to AFSC and Hq USAF (in turn), subj: Request for Determination and Findings Pursuant to AFPI 3-214, 25 May 65.

275. SSD (SSLO) Ltr to AFSC (SCOO), subj: Request for Organization Change - Gemini Agena Division (SSVAT), 29 Jul 65.

276. SSD (SSVA) Ltr (C/Gp4) to SSEH, subj: Historical Report, 1 January 1965 - 30 June 1965, 9 Aug 65, w/5 Atch: Atch 1 (C/Gp4).

277. Msg Cite SSG 10111, 20 Oct 65.

278. SSD (SSV) Ltr to SSGS (B/Gen Martin), subj: Program 206-II Agena Launch Capability Contract, 3 Nov 65.

279. AFSC Ltr sgd Gen B. A. Schriever to SSD (MajGen Funk) and AEDC (BrigGen Gossick), 22 Nov 65.

280. Msg Cite SSG 10125 Nov 65.

281. SSD (SSVA) Ltr (C/Gp4) to SSEH, subj: Historical Report, w/6 Atch: 1. (U); 2. omitted; 3 (U); 4. (U); 5 (C); 6. (U); 7. (C), 8 Feb 66.

282. SSD (SSK) Ltr to AFSC and Hq USAF, subj: Request for Determinations and Findings Pursuent to AFPI 3-214, 8 Jul 66.

283. SSD (SSVA) Ltr (Uncl w/o C/Gp4 Atchs 2, 4, 5 & 8), subj: Historical Report for the Period of 1 January 1966 - 30 June 1966, 29 Jul 66.

284. SSD (SSV) Ltr to SSGS (Gen Martin), subj: Agena Guidance and Control Subsystem Development, 1 Feb 67, (C/Gp3).

285. SSD (SSVA) Ltr (Uncl w/o C/Gp4 Atch 2, 7, 8 & 9) to SSV, subj: Historical Report, 1 Jul 66 to 31 Dec 66, 3 Feb 67.

286. DAF Ltr (C/Gp3) to SSVA, subj: Attitude Control System Configuration, 8 Feb 67.

287. DAF (SP-7B) Ltr to SSVA (Major Bell), subj: Standard Agena Allocation, 13 Feb 67.

288. AFRPL (RPG) Ltr to SSD (SSGV/Col D. V. Miller), subj: Advanced Agena Development, 26 Mar 67.

289. SSD (SSVAP) Ltr (S/Gp3) to SSEH (Mr. McClellan), subj: Users of Standard Agena Vehicle, 7 Apr 67.

290. SSD (SSVA) Ltr to SSV (Col Hamilton), subj: Improved Agena Development Program, 28 Apr 67.

290a. Briefing Charts (S/Gp3), Report of Special Board on Agena Procurement, SAFSP, 1 May 67.

290b. Msg (C/Gp3), Cite SSG 67-12, 24 May 67.

290c. Msg (C/Gp4), Cite SCSS 22931, 262111Z 67, May 67.

291. SSD (SSV) Ltr to SAFSP (Gen Martin), subj: SSD Position on SAFSP Proposal for a New Production Management Concept for Agena, 2 Jun 67.

292. MFR sgd Maj Robert R. Crawford, 7 Jun 67.

293. SSD (SSVA) Ltr (C/Gp3) to SMSS (Gen Martin), subj: Improved Agena Performance Requirements, 12 Jun 67.

294. DAF (SP-2) Ltr (C/Gp3) to multiple addresses, subj: Improved Agena, 15 Jun 67.

295. Lockheed Briefing Charts, subj: Customized Standard Agena, 21 Jun 67.

296. DAF (SP-1) Ltr (C/Gp3) to SSD (Gen Cooper), subj: Improved Agena, 23 Jun 67.

297. MFR sgd MajRobert F. Crawford, subj: Improved Agena Requirements Meeting, 28 Jun 67.

298. Briefing Charts on Agena D and E Management Problems, 11 Jul 67.

299. SAMSO (SMVA) Ltr (Uncl w/o C/Gp4 Atch 5 and 8) to SMV, subj: Historical Report, 27 Jul 67.

300. Program Plan, subj: Customized Standard Agena, Support Engineering Program Plan, Contract F04695-67-C-0092, 27 Jul 67.

301. Briefing Charts, subj: Standard Agena, 28 Jul 67.

302. SAMSO (SMVA) Ltr to SMSS (Gen Martin), subj: Agena D Contract Structure, 2 Aug 67.

303. SAMSO (SMG) Ltr (C/Gp4) to SAFSP (Gen Martin), subj: Improved Agena Flight Test, 11 Aug 67.

304. DAF (SP-1) Ltr (C/Gp3) to SMG-2 (Gen Cooper), subj: Improved Agena Flight Test, 14 Aug 67.

305. SAMSO (SMV) Ltr to SAFSP (Gen Martin), subj: New Production Management Concept for Agena, 22 Aug 67.

306. DAF (SP-1) Ltr (C/Gp3) to SMG-2 (Gen Cooper), subj: Improved Agena, 30 Aug 67.

306a. SAMSO (SMG-2) Ltr (C/Gp3) to SMSS (Gen Martin, subj: Improved Agena, 7 Sep 67.

306b. DAF (SP-1) Ltr (S/Gp3) to SMG-2 (Gen Cooper), subj: New Production Management Concept for Agena, 8 Sep 67.

306c. Memorandum for Gen O'Neill (C/Gp4) sgd MajGen Paul T. Cooper, subj: New Production Management Concept for Agena, 18 Sep 67.

307. MFR sgd LtCol Allen J. Poor, subj: Custom Agena Briefing to Gen Martin, 19 Sep 67, w/1 Atch: Briefing Charts, subj: Custom Agena.

308. DAF (SS-2) Ltr (S/Gp3) to SSH-2 (Gen [illegible]), subj: Procurement of Agena for SAMSO, 20 Sep 67.

309. SAMSO (SSB) Ltr to SCGH-27 (Col F. G. [illegible], Jr), subj: Manpower Packages for the Titan III [illegible] and the Agena Program Office, 10 Oct 67.

310. Msg (S/Gp4), Cite SCGSM 36065, 132134Z Oct 67.

[redacted]

313. List of Contracts (containing Estimated Face Value) (C/Gp4), subj: Agena Vehicle, undated.

~~CONFIDENTIAL~~

DEPARTMENT OF THE AIR FORCE
DIRECTORATE OF SPECIAL INVESTIGATIONS (IG)
[illegible] LOS ANGELES, CALIFORNIA [illegible]

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~~CONFIDENTIAL~~

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS OF SPECIAL PROJECTS (SAFSP)
AF UNIT POST OFFICE, LOS ANGELES, CALIFORNIA 90045

13 FEB 1967

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REPLY TO ATTN OF: SP-73/Capt [illegible]/3-1925

SUBJECT: Standard Agena Allocation

TO: SSVA (Major Bell)

1. [redacted] requests that all 1191 Standard Agena vehicles presently under procurement be delivered with the current guidance subsystem installed. Due to the high cost of implementing the Guidance Control Electronics, Velocity Cut-Off System and the MIT Inertial Reference Package, this office does not plan to incorporate these systems. Consideration would be given for usage if future program procurements are made.

2. Further request you submit a list showing Standard Agena allocations for Program 846 usage.

CHARLES L. MURPHY, Col, USAF
Deputy Director

.258

[redacted]

[illegible] RPC

[illegible] Advanced Agena Development [illegible]

[illegible] SSD (SSGY/Col D. V. [illegible])
AF Unit Post Office
Los Angeles, Calif [illegible]

1. A few months ago AFRPL entered discussions with Colonel A. Gardner relative to this Laboratory's participation in your Advanced Agena Development Program. Under Colonel Douthett's leadership and with management stimulus from our higher headquarters, we have improved our effectiveness in providing engineering support to AFSC's weapon systems divisions.

2. Use of AFRPL as SSD's "engineering arm" seems to be a natural. An alternate would be to use Aerospace Corporation as your engineering support element. The basic Agena propulsion was developed by the Air Force (including laboratories) and its contractors without using Aerospace. At the time the 6 Dec 1966 letter was prepared (Atch #1), it seemed that the three parties; i.e., SSD, Lockheed and Bell, were in favor of utilizing AFRPL for engineering support.

3. Within the past 6 months we have evidenced significant growth in our support of BSD. Typical of the understanding we establish with BSD on each of their programs we support is the correspondence dated 9 Dec 66 and 16 Dec 66 (Atch #2).

4. Recently we have proposed a method for assessing the effectivity of laboratories. Three copies of this proposal report are attached. You will note that the proposal promotes further "coupling" between laboratories and the systems divisions. You will find laboratory effectivity being measured largely by the impact that laboratories can bring into Air Force weapon systems. Not only are you the target of our technology product, but you also validate the worth of any technology.

5. We remain interested in supporting your development of the advanced Agena and wish to conclude a degree of formality much the same as we have been doing with BSD. In the event that SSD has other plans in mind, we would appreciate being advised.

D. M. ROSS
Deputy Director

3 Atch
1. Ltr, RPREC, 6 Dec 66
2. Ltr, BSRP, 9 Dec 66 and RPG, 16 Dec 66
3. Report, "Proposal for Assessment of Lab Effectivity" (3 cys)

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS SPACE SYSTEMS DIVISION (AFSC)
AF UNIT POST OFFICE, LOS ANGELES, CALIFORNIA 90045

REPLY TO ATTN OF: SSVAP

7 APRIL 1967

SUBJECT: Users of Standard Agena Vehicle

TO: SSEH (Mr. McClellan)

1. Following are the programs supported by the Standard Agena vehicle during the periods indicated.

1962 - 162, 698BK

1963 - 162, 698BK, [redacted]

1964 - 698BK, 162, [redacted] 241, [redacted]

1965 - 241, [redacted] Vela, OGO-C, Gemini

1966 - [redacted] 241, [redacted] Gemini, OAO, 461, [redacted] 206II,
[redacted] Orb[redacted], ATS

1967 - 846, [redacted] Lun Orb, [redacted] ATS, [redacted]
OGO-D, Nimbus.

William R. Bell
WILLIAM R. BELL, Maj USAF
Chief, Program Control Div.
Agena Program Office

DOWNGRADED AT 12 YEAR
INTERVALS; NOT AUTOMATICALLY
DECLASSIFIED. DOD DIR 5200.10

SSVA-1933

~~[illegible]~~
UNCLASSIFIED

SSYA

23 Apr 67

Improved Agena Development Program

SSY (Col Hamilton)

1. On 20 April, I discussed the outline of my briefing (intended for Secretary Flax) with [redacted] AFSC. I then gave the briefing to the Hq USAF Space Panel chaired by [redacted] There were no significant comments.

2. On 21 April, I briefed Assistant Secretary of the Air Force for R&D, Dr. Flax, on the Improved Agena Program. [redacted] Discussions with Secretary Flax centered mainly around the present effort to establish complementary subsystems for the Improved Agena and schedule/costs estimates. He affirmed the significance of the schedule and the importance of good funds estimates.

3. Also on 21 April, I briefed Mr. [redacted] DDR&E. Discussion covered the following main points:

   a. Recommendation that an incentive plan take into account performance and schedule in addition to cost.

   b. The possible use of the vehicle on a Titan IIIC booster.

   c. The resolution of plans for appropriate complementary subsystems.

In a discussion between [redacted] it was made clear that DDR&E does not have further action items at this time. Hq USAF will take all necessary action to program funds and to monitor progress of the program through normal channels. It was agreed that upon receipt of the necessary funds, SSD will proceed with Phase II of the program as outlined. I was told that the required FY 67 funds are immediately available and that action is underway to provide the FY 68 funds.

4. I wish to reiterate several points which I have made to you and to General Cooper in the past. At the present time, the Agena Program Office is not manned adequately to provide the necessary assurance of good schedule and costs control management which is required to complete this program in keeping with the briefings made on 21 April. Due to the pressure of other activities, we cannot assure timely and adequate procurement action for the Phase II procurement, especially with regard to the formulation and negotiation of the recommended incentive plan. The failure of this office to receive adequate manning is complicated with other major management objectives at this time. Some of the more significant items are:

a. The resolution of the Contract -939 problems which are precluding negotiation activity.

b. The resolution of -0077 Contract problems which are related to the -939 Contract.

c. The half-completed configuration management program clean-up which I started when I first was assigned as Agena Program Director and which retains its importance relative to present and future programs.

d. The development of adequate component/vehicle interface controls.

e. The establishment of an orderly system of overall management reports and meetings between this office and the contractors.

f. Effective and timely technical evaluations to support various procurement actions for subsystems, studies, and vehicles.

g. The establishment of adequate system program office long-range planning and analyses of methods, costs and technical development efforts, in keeping with good management techniques. Poorly accomplished items at this time lead to down the road complications which result in further intensification of the manpower problem.

I have been involved in system program office management since 1956 on five major programs. I have seen the results of failure to act on organizational and manning problems as well as the results of timely action. It is my opinion that if no action is taken at this time to increase the present level of manning in the Agena Program Office, that the Improved Agena Program is headed toward overrun and behind schedule status. We lack the capability to do the management job that is required of this program which for development purposes alone will expend about 35 million dollars in the next two years. In addition within six months, we must have defined and taken contractual action for flight hardware to support operating requirements. The complications of inadequate manning and the resultant need for me to devote my time to too much fire-fighting and too little general management have impaired my capability to accomplish my job in the manner and depth that are necessary.

[redacted] Col, USAF
Program Director, Agena
Deputy for Launch Vehicles

pfc

FROM

[illegible] LOS ANGELES CALIF

TO

AFSC

SPECIAL INSTRUCTIONS
COPY TO:(Mail) Gen Martin Col Hamilton LtCol McHenry Col Diehl Col Gardner Col Riddle Mr. Whalen Mr. Forslund Col Keefer. Col Douthett Maj Crawfold Maj Bell Maj Davis Maj Bradford LtCol Hedlund

CONFIDENTIAL SSC 61-13 MAY 67

SUBJECT: RED LINE PRESTO - SSD

REFERENCES:

(A) D&F NO. 67-11C-91, 13 JAN 67.

(B) FINAL PROCUREMENT ACTION APPROVAL, 13 JAN 67 AND ASSOCIATED FORM 111 (P-66-[illegible]-6.44.09.12.4).

(C) BRIEFING, IMPROVED AGENA TO HQ AFSC, HQ USAF, SAFRD AND ODDR&E BY AGENA PROGRAM DIRECTOR, 20-21 APR 67.

PART I. 1. THIS IS AN EXISTING PROBLEM.

2. THE IMPROVED AGENA PRELIMINARY DESIGN REVIEW WAS CONDUCTED BY THE PROGRAM OFFICE 15-19 MAY 67. REPRESENTATIVES OF THE AF ROCKET PROPULSION LABORATORY, AEROSPACE CORP, AFPRO, AND LOCKHEED MISSILES AND SPACE CO PARTICIPATED. BASED ON THE

DATE 24	TIME
MONTH MAY	YEAR 1967
PAGE NO 1	NO. OF PAGES 1

DRAFTER	TYPED NAME AND TITLE Att [redacted] USAF and Col, USAF [illegible] Vehicles	PHONE 32288/ 32228	
RELEASER	SIGNATURE SIGNED	TYPED (or stamped) NAME AND TITLE PAUL T [illegible] Major General, USAF	

SECURITY CLASSIFICATION
CONFIDENTIAL

DOWNGRADED AT 12 YEAR INTERVALS: NOT AUTOMATICALLY DECLASSIFIED. DOD DIR 5200.10

DD FORM 1 NOV 65 173

REPLACES EDITION OF 1 MAY 59 WHICH MAY BE USED

JOINT MESSAGEFORM - CONTINUATION SHEET

SECURITY CLASSIFICATION

FROM

SSD

RESULTS, THE PROGRAM DIRECTOR DETERMINED THAT IT WAS UNWISE TO PROCEED INTO PHASE II OF THE DEVELOPMENT PROGRAM ON THE SCHEDULED DATE, 20 MAY 67. CONSEQUENTLY THE ALREADY HIGHLY COMPRESSED SCHEDULE CALLING FOR A MARCH 69 DD 250 OF THE FIRST PRODUCTION VEHICLE IS IN INCREASING JEOPARDY.

3. THE CONSIDERATIONS WHICH COLLECTIVELY RESULTED IN THE DECISION NOT TO PROCEED ON SCHEDULE ARE AS FOLLOWS:

(1) INADEUATE PROGRAM DEFINITION: FROM THE OUTSET, IT WAS REALIZED THAT ACHIEVEMENT OF ADEQUATE DEFINITION IN 90 DAYS WAS AN OPTIMISTIC GOAL. THE GOAL HAS NOT BEEN REACHED AND ADEQUATE TOOLS TO INSURE VEHICLE PERFORMANCE AND CONTROL CONTRACTOR'S COSTS AND SCHEDULE HAVE NOT YET BEEN DEVELOPED.

(2) CRITICAL TECHNICAL PROBLEM: AS A RESULT OF THE PRELIMINARY DESIGN REVIEW AND A REVIEW OF THE RECENT DATA DEVELOPED BY INVESTIGATIONS OF THE CURRENT TURBINE PUMP ASSEMBLY FLIGHT ANOMALY PROBLEM (PROJECT COUGHDROP), THE APPLICATION OF AN UPRATED VERSION OF THE CURRENT PUMP ASSEMBLY IS CONSIDERED AN UNACCEPTABLE RISK.

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	2	4		GO

☆ U. S. GOVERNMENT PRINTING OFFICE: 19[illegible]

JOINT MESSAGEFORM - CONTINUATION SHEET

SECURITY CLASSIFICATION

[illegible]

[illegible]

(B) UNAVAILABILITY OF PRELIMINARY COST PROPOSAL:

THE CONTRACTOR'S COST PROPOSAL FOR PHASE II WAS DUE FOR SUBMISSION 15 MAY 67. TODATE IT HAS NOT BEEN SUBMITTED. IT HAS ALWAYS BEEN A PROGRAM OFFICE CONDITION THAT PHASE II WOULD NOT PROCEED WITHOUT A DETAILED COST PROPOSAL.

PART II. ASSISTANCE REQUIRED:

1. I DO REQUIRE THE ASSISTANCE OF HIGHER HEADQUARTERS.

2. RECOMMENDED COURSE OF ACTION: WE HAVE BEEN INFORMALLY ADVISED BY SAFSP THAT THE NEED DATE FOR THE FIRST VEHICLE MAY BE RESCHEDULED. BASED ON THE USER NEED DATE THE CURRENT SCHEDULE OF MARCH 69 DD 250 OF THE FIRST PRODUCTION IMPROVED AGENA VEHICLE CAN BE EXTENDED TO SEPTEMBER 70. THIS WOULD PERMIT ADEQUATE COMPLETION OF PHASE I EFFORT AND ALLOW INCORPORATION OF A COOLED-BEARING TURBINE PUMP ASSEMBLY. REQUEST APPROVAL OF THIS COURSE OF ACTION BY 12 JUNE 67.

3. ALTERNATIVE COURSES OF ACTION:

(A) IF YOU ARE WILLING TO ACCEPT THE RISK ASSOCIATED WITH UPRATING THE CURRENT TURBINE PUMP DESIGN, EXTEND THE CURRENT SCHEDULE OF MAR 69 DD 250 TO

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☆ U. S. GOVERNMENT PRINTING OFFICE: [illegible]

JOINT MESSAGEFORM - CONTINUATION SHEET

SECURITY CLASSIFICATION

FROM:

SSD

MAY 69. YOUR DIRECTION IF THIS ALTERNATIVE IS SELECTED IS REQUIRED BY 12 JUN 67.

(B) IF THE MAR 69 DD 250 DATE IS INVIOLATE, AND THE TECHNICAL AND COST RISKS ARE ACCEPTABLE, YOUR DIRECTION TO PROCEED IMMEDIATELY INTO PHASE II IS REQUIRED BY 26 MAY 67.

4. ADDITIONAL COORDINATION WITH SAFSP IS REQUIRED AND THIS COORDINATION IS UNDERWAY. INCLUDED IS HAVING THEM SPECIFY DETAILED MISSION REQUIREMENTS. IF HEADQUARTERS IS AWARE OF ANY OTHER MISSION REQUIREMENTS OTHER THAN THOSE OF SAFSP REQUEST ADVISEMENT.

PART III. COMMANDER'S COMMENTS:

I AGREE WITH THE PROGRAM DIRECTOR'S ANALYSIS OF THE PROBLEM, HIS IMMEDIATE ACTION AND HIS RECOMMENDED COURSE OF ACTION. I URGE YOUR APPROVAL AND SUPPORT IN GAINING APPROVAL OF THIS COURSE OF ACTION FROM HQ USAF AND SAFRD. GP-3.

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DD FORM 1 MAY 55 173-1

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[redacted]

~~CONFIDENTIAL~~

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2 JUN 1967

SSV

SSD Position on SAFSP Proposal for a New Production Management Concept for Agena

SAFSP (Gen Martin)

1. Pursuant to your briefing and our discussion on 29 May 1967, I would like to restate the position that I expressed to you at that time. Your Proposal 3 would relegate the role of SSD to one of a procuring authority for parts and components, as opposed to the SSD mission which is system responsibility - including responsibility for design, development, test and procurement of a system. What you are proposing is contrary to the management concept that has evolved over the years wherein we place the total RDT&E responsibility, including procurement actions, under single management. In the event that you do proceed with the components and parts approach, your Option 3 1/2 appears to be the only one of the two that is manageable since you as program manager will have all elements of the program directly under you.

2. However, I believe that a more acceptable solution can be reached. There is a possibility of future NASA business. If additional uses for Agena should materialize, your Option 3 or 3 1/2 would be even less desirable. It seems reasonable to me that an ascent vehicle could be built and tested as a system as separate and distinct from the procurement mode. Such an arrangement should satisfy your objections to the current Standard Agena as well as provide an integrated Agena Ascent Vehicle which would interest NASA as well as other programs. In order to achieve this we will have to obtain your requirements on a more timely basis in order to exercise proper configuration control and to facilitate production to meet user requirements.

3. I believe that such an ascent vehicle could be defined which would be an [illegible] as well as a viable system for use. However, [illegible] currently engaged full time in [illegible] to instruct Lockheed [illegible] on the Phase I [illegible] Phase II. Additionally, we are working a number of technical problems with which

[illegible] a well conceived solution I suggest [illegible] this problem to allow my program office to clean [illegible] before addressing the management problem which you [illegible] suggest a team approach with SAFSP, the SSD Agena [illegible] Lockheed all participating.

SIGNED

[redacted]

MEMO FOR RECORD 7 June 1967

During Colonel Keefer's staff meeting on 7 June 1967, he stated that Generals Ferguson, Cooper and Martin were meeting with Doctor Flax today to discuss SP's approach to Agena management. As a result we should receive guidance on what to build.

[redacted] Major, USAF
Acting Chief, ering Division
Agena Program Office

file

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SSVA/Col Keeler/5222

Improved Agena Performance Requirements

SSGS (General Martin)

1. As we have discussed recently in connection with the Red Line Presto message on the Improved Agena Program schedule adjustment, this system development is in urgent need of your inputs to mission performance requirements and a resolution of subsystem developments to be pursued.

2. The Improved Agena has been laid out as a two phase program in which Phase I consists of contract definition and Phase II involves design, development and production of the first vehicle. We are currently part way through the Phase I activity with a rescheduled goal of completion by 15 Jul 67, followed by immediate commencement of Phase II. At the Preliminary Design Review conducted in mid May 1967, at which you had representation, it became clear that adequate contract definition in terms of the work statement, specifications and cost proposal could not be achieved meaningfully without your inputs of mission performance requirements and an identification of the subsystems that need modification or redesign to satisfy your requirements. As you recall, I asked in my recent Red Line Presto message that other requirements, DOD and NASA, be identified and sent to me right away.

3. The current status of Improved Agena definition presents a number of inconsistencies, incompatibilities and omissions due largely to our lack of visibility in the area of desired vehicle performance characteristics envelopes concerning, for example, required orbit life, pad hold time, payload weights and volumes, first stage booster considerations, flight profiles, time on orbit, orientations on orbit, accuracies and reliability requirements. When these needed performance characteristics are known, the subsystem picture will begin to clear, i.e., guidance, power, tracking telemetry and command, propulsion (primary and secondary), environmental control, AGE and facilities. I recognize that there will need to be a close working relationship between your organisation and my Agena SPO in the selection and development of these subsystems because of your variety of peculiarization and closely related hardware developments.

Group 3
Downgraded at 12 year
intervals; not
automatically declassified

~~CONFIDENTIAL~~

4. In my view there is a need for a management mechanism that will routinely provide for an interchange of requirements, status, problem identification and resolution between your organization and the Agena SPO. To this end, I propose a regular meeting, perhaps monthly, to be chaired by my Agena Program Director, Col Norman J. Keefer, with a designated spokesman for SAFSP and additional representation from the SPO and each of your Project Offices. The first of these meetings should take place as soon as possible to insure early availability of your inputs to the definition of the Improved Agena Program.

5. I am convinced that a more formally constituted channel of communication between our two organizations will go a long way in relieving existing incompatibilities. I will look forward in the very near future to the identification of your primary representative and a suggested first meeting date for the group.

SIGNED

PAUL T. COOPER
Major General, USAF
Commander

[redacted]

12 June 67 12 Jun 67 12 June 67 12 June 67

[redacted]

[redacted]

[redacted]

21 Jun 1967, Lockheed
briefing to Agena and SP personnel o
customized Agena. This was in respo
to Agena SPO request.

OBJECTIVE: o TO TURN OUT VEHICLES FROM STANDARD AGENA WHICH ARE CONFIGURED TO THE SPECIFIC USING PROGRAM REQUIREMENTS

METHOD: o DEFINE (BY SPECIFICATION) THE VEHICLE CONFIGURATIONS FOR 3 OR 4 PROGRAMS AND CONTRACT TO BUILD AND DELIVER SPECIFIC QUANTITIES OF EACH CONFIGURATION AT A SPECIFIED RATE

o BUILD THE VEHICLES IN TWO STAGES: FIRST, FABRICATE AND ASSEMBLE BASIC, UNCHANGING PORTIONS, RUN TEST, AND STORE; THEN, PULL FROM STORAGE, DO RETROFITS, ADD FINAL EQUIPMENTS, ACCEPTANCE TEST VEHICLE, DD-250, AND DELIVER TO PROGRAM

CUSTOMIZED STANDARD AGENA

IMPLEMENTATION:

1. ESTABLISH "SENIOR REQUIREMENTS PANEL" AT LMSC AND AT AFSSD TO SELECT PROGRAM CONFIGURATIONS AND DEFINE REQUIREMENTS

2. INITIATE BOA ON -589 CONTRACT TO WRITE SPECIFICATIONS, DO ENGINEERING, PRODUCE PRODUCTION DRAWINGS, HOLD DESIGN REVIEWS, BUILD MOCKUP, CONFIGURE DEV, BUILD AND QUALIFY ANY NEW COMPONENTS, DEFINE TESTING, AND WRITE ATP'S

3. CCN THE PRODUCTION CONTRACT TO CALL FOR DELIVERY OF "CUSTOMIZED" VEHICLES AS DEFINED IN ABOVE SPECIFICATIONS

CUSTOMIZED STANDARD AGENA

SENIOR REQUIREMENTS PANEL

	AT LMSC	AT AFSSD
CHAIRMAN	REPRESENTATIVE OF F.C.E. ODER	
MEMBERS	PROGRAM MANAGERS OR REPRESENTATIVES FROM STANDARD AGENA AND EACH USING PROGRAM	REPRESENTATIVES OF STANDARD AGENA AND USING PROGRAM SPOS
FUNCTIONS	1. ESTABLISH ORGANIZATIONAL DEVELOPMENT/ PROCUREMENT RESPONSIBILITY FOR ALL SSD FLIGHT EQUIPMENT	1. CONFIRM AND APPROVE THE ACTIONS OF THE LMSC PANEL
	2. DESIGNATE THE PROGRAM VEHICLE TO BE SUPPLIED	2. ESTABLISH OFFICIAL VEHICLE ASSIGNMENTS
	3. DEFINE THE REQUIREMENTS FOR EACH OF THE DESIGNATED VEHICLES (TECHNICAL, QUANTITY, AND SCHEDULE)	3. INITIATE AND REVISE OFFICIAL PROGRAM REQUIREMENTS
	4. REVIEW AND APPROVE OVERALL REQUIREMENTS AND CONFIGURATION FOR CUSTOMIZED STANDARD AGENA	4. REVIEW AND APPROVE CONTRACTUAL DOCUMENTS

CUSTOMIZED STANDARD AGENA

ENGINEERING IMPLEMENTATION

ACTIVATE A PROGRAM UNDER THE -589 CONTRACT TO:

1. PREPARE A PART I SPECIFICATION FOR EACH CONFIGURATION TO BE DELIVERED
2. CONDUCT FORMAL PDR'S
3. DO DETAILED DESIGN AND NECESSARY DEVELOPMENT
4. CONDUCT FORMAL CDR'S
5. BUILD AND QUALIFY REQUIRED NEW EQUIPMENTS
6. BUILD MOCKUP(S)
7. DEFINE TEST REQUIREMENTS AND WRITE ATP'S
8. CONFIGURE DEV AND USE TO VERIFY ATP'S AND TEST COMPLEX
9. PREPARE COMPLETE PRODUCTION DOCUMENTATION PACKAGE (PART II SPECS)

CUSTOMIZED STANDARD AGENA

PRODUCT CONTRACT INCORPORATION

- WRITE ECP TO -939 CONTRACT TO CHANGE DELIVERIES FROM STANDARD AGENAS TO CUSTOMIZED STANDARD AGENAS (AS DEFINED BY SPECIFICATIONS) EFFECTIVE FROM AD-197 AND UP

- MODIFY WORK STATEMENT TO DEFINE NEW ACCEPTANCE TEST REQUIREMENTS

- MODIFY CONTRACT TO PERMIT PARTIAL PAYMENT BASED ON PLACEMENT OF VEHICLES IN STORAGE

CUSTOMIZED STANDARD AGENA

-939 CONTRACT VEHICLE ASSIGNMENTS (AFTER AD-193)

AD #	SCHEDULE DELIVERY	ASSIGNED PROGRAM	AD #	SCHEDULE DELIVERY	ASSIGNED PROGRAM
194			204		
195			205		
196			206		
197			207		
198			208		
199			209		
200			210		
201			211		
202			212		
203			213		

CUSTOMIZED STANDARD AGENA

PROPOSED CHANGE IN -939 CONTRACT DELIVERIES

1. NO CHANGE THROUGH AD-196

2. FOR THE 17 VEHICLES FROM AD-197 THROUGH AD-213

[redacted]

3. WITHOUT SPECIFYING WHICH, DELIVER AT A RATE OF 1-1/2 VEHICLES PER MONTH

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

1014

[redacted]

MEMO FOR RECORD

28 June 1962

SUBJECT: Improved Agena Requirements Meeting

1. On 27 June the initial Improved Agena Requirements Meeting was held in Colonel Heater's office. Important points resulting from the meeting are:

a. SP is willing to provide Improved Agena requirements in as much detail as they can at this date.

b. Our requirements format will be completed and a joint SP reply will be returned to us.

c. It is SP's feeling that Improved Agena should be produced in the same manner as the SP concept for Standard Agena.

d. In general, SP is not interested in standardization if it imposes any restriction on their requirements.

[redacted] Major, USAF
Acting Chief, Engineering Division
Agena Program Office

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[illegible]. Briefing on Agena D and E Management Problems. This briefing was given to Gen Cooper. It resulted in setting up an LMSC meeting with Gen Cooper, Colonel's Hamilton and Reith.

AGENA D AND E

MANAGEMENT PROBLEMS

11 JULY 1967

BRIEFING OUTLINE

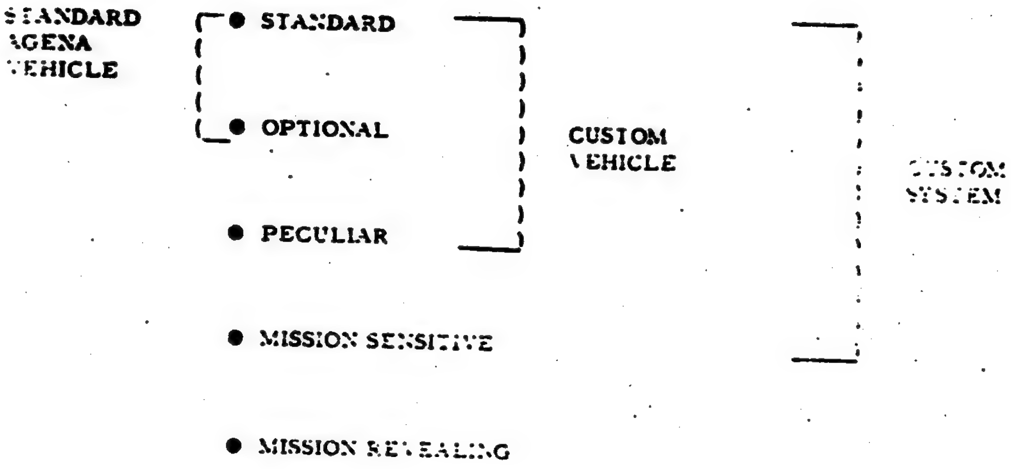
- AGENA D MANAGEMENT CONCEPTS
  - I
    - CUSTOM VEHICLE FEASIBILITY STUDY
    - ALTERNATE APPROACHES
    - CONCLUSIONS AND RECOMMENDATIONS
  - II
    - CONTRACT STRUCTURE
    - RECOMMENDATION
  - III
    - COUGH DROP RETROFIT PROGRAM
    - RECOMMENDATIONS
- AGENA E DEVELOPMENT CONCEPTS
  - IV
    - SOLE SOURCE CONSIDERATIONS
    - CONCLUSIONS AND RECOMMENDATIONS
  - V
    - SP CONCEPT
    - SPO CONCEPT
    - CONCLUSIONS
    - RECOMMENDATIONS
- RECOMMENDATIONS SUMMARY

AGENA D

BACKGROUND

- SP'S OBJECTIONS TO STANDARD AGENA CONCEPT
    - REQUIRES EXTENSIVE EQUIPMENT REMOVAL
    - INVALID SYSTEM FUNCTION TESTS
    - LACK OF RESPONSIVENESS AND CONTROL [illegible]S
    - OFF INTENT [illegible] INCENTIVE CON[illegible]
- SP CONCEPT
- JOINT SPO/SP/AFPRO/LMSC SYSTEM VEHICLE [illegible]

EQUIPMENT AND PRODUCTS



STANDARD AGENA VEHICLE

- STANDARD
- OPTIONAL
- PECULIAR
- MISSION SENSITIVE
- MISSION REVEALING

CUSTOM VEHICLE

CUSTOM SYSTEM

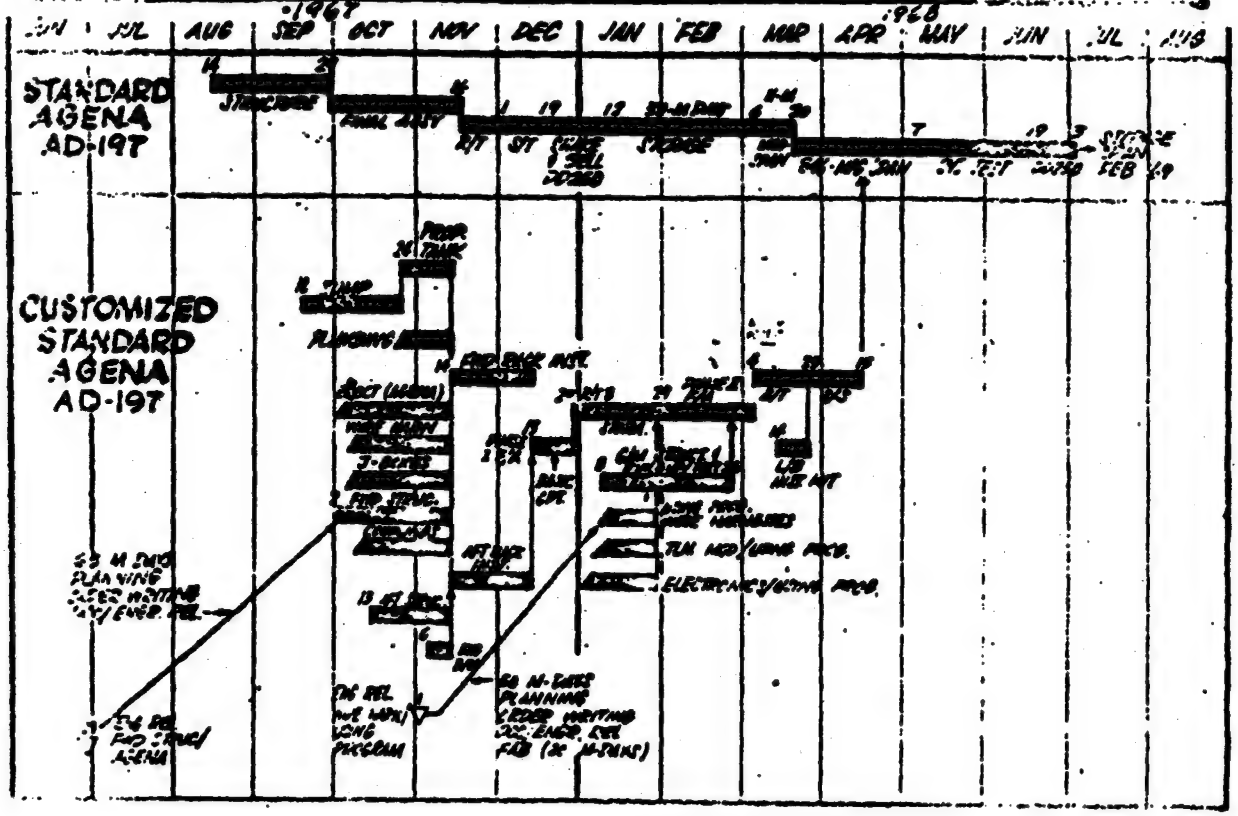
AGENA D

CUSTOM VEHICLE FEASIBILITY STUDY

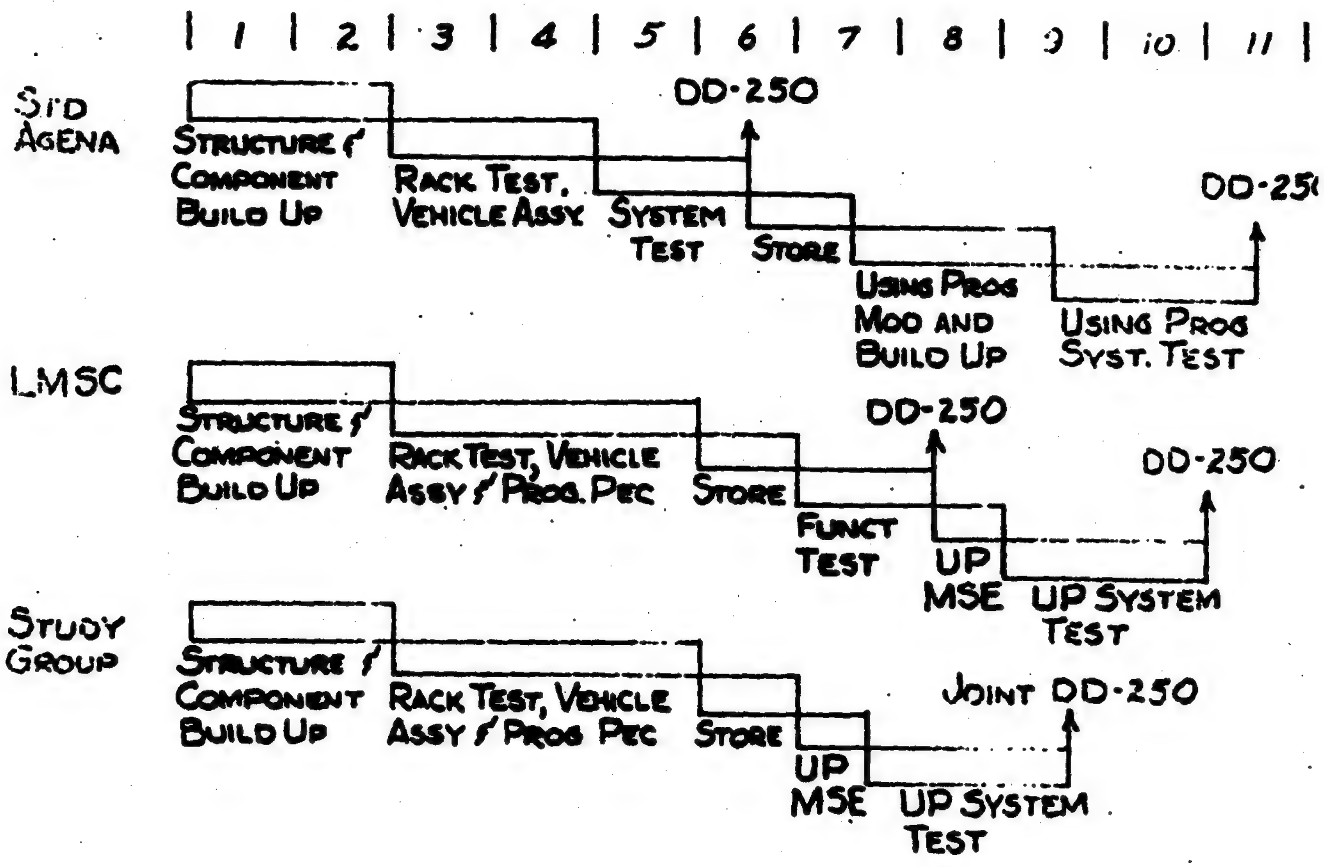
- APPROACH
  - LMSC
    - o ASSEMBLE CUSTOM VEHICLE
    - o LIMITED FUNCTIONAL TEST
    - o DD-250
    - o TRANSFER TO USER
  - AIR FORCE
    - o ASSEMBLE CUSTOM VEHICLE
    - o TRANSFER TO USER
    - o ADDITIONAL ASSEMBLY
    - o SYSTEM TEST
    - o JOINT DD-250

- FINDINGS - CUSTOMIZED AGENA VEHICLE FEASIBLE

CUSTOMIZED STANDARD AGENA



CUSTOMIZED STANDARD AGENA



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AGENA D

ASSESSMENT OF CUSTOM VEHICLE

- ADVANTAGES
  - ELIMINATES NECESSITY FOR DISASSEMBLY
  - ELIMINATES INVALID TESTING
  - INITIAL REDUCTION OF SYSTEM COSTS
- DISADVANTAGES
  - CONTRARY TO AFSC SYSTEM CONCEPT
  - REMOVES STANDARD SPACECRAFT FROM THE INVENTORY
  - ADVANTAGES OF STANDARDIZATION LOST
  - DIVIDES RESPONSIBILITIES BETWEEN TWO COMMANDS

AGENA D

MODIFIED D VEHICLE

- ADVANTAGES
  - NO DISASSEMBLY OR REWORK
  - DECREASED COST
- DISADVANTAGES
  - VIOLATES AFSC SYSTEM CONCEPT
  - TAKES STANDARD AGENA OUT OF INVENTORY
  - ADVANTAGES OF STANDARDIZATION LOST
  - DIVIDES RESPONSIBILITY BETWEEN TWO COMMANDS

AGENA J

SP OPTION 3 1/2

- **ADVANTAGES**
  - CLEANS UP LINES OF RESPONSIBILITY AND AUTHORITY
  - ELIMINATES NECESSITY TO DISASSEMBLE VEHICLE
  - COMMUNICATIONS PROBLEM SOLVED
  - RAPID REACTION PROBLEM SOLVED
  - ALLOWS SAFSP TO HANDLE CONTRACT INCENTIVE PROBLEM AS THEY DESIRE
  - PROVIDES BEST CONTROL FOR SAFSP

- **DISADVANTAGES**
  - ELIMINATES STANDARD AGENA FROM INVENTORY
  - CONTRIBUTES TO BUILD-UP OF A SECOND "SYSTEMS COMMAND"
  - COST TO GOVERNMENT WOULD INCREASE
  - SETS PRECEDENT FOR AGENA E

AGENA D

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CUSTOM SYSTEM

- ADVANTAGES
  - COMPATIBLE WITH SYSTEMS COMMAND'S SYSTEM ACQUISITION MISSION
  - ELIMINATES SOME SP OBJECTIONS
  - CLEAR CUT LINES OF RESPONSIBILITY AND AUTHORITY
  - SYSTEM AVAILABILITY TO OTHER USERS
- DISADVANTAGES
  - MAJOR CHANGE IN CONCEPT
  - ADVANTAGES OF STANDARDIZATION ARE LARGELY LOST
  - ADDITIONAL SPO MANPOWER REQUIRED
  - SECURITY CLEARANCE PROBLEMS

MANAGEMENT SPECTRUM

RATING:	UNACCEPTABLE	MARGINAL	ACCEPTABLE	GOOD	BETTER	IDEAL
CONCEPT:	SP PROPOSAL	SPO CUSTOM VEHICLE	SP CUSTOM VEHICLE	STANDARD AGENA VEHICLE	SPO CUSTOM SYSTEM	SPO SPACE SYSTEM
SAMSO MANAGEMENT:	COMPONENT	COMPONENT	N/A	"SYSTEM"	SYSTEM	TOTAL SYSTEM
SAMSO PRODUCT:	o SIMILAR TO AGENA A & B o SKUNK WORKS	o SAME AS SP PROPOSAL ONLY ASSEMBLED o UNABLE TO TEST OR FLY o PAYLOAD CUSTOMER COMPLETES SYSTEM & TESTS	o N/A	o STANDARD VEHICLE o UNABLE TO FLY o TESTED USING SLAVE & SIMULATION EQUIPMENT	o NON-STANDARD SYSTEM o CAN BE TESTED & FLOWN	o STANDARD OPERATIONA TOTAL SYSTEM

CONCLUSION

- CUSTOM VEHICLE IS FEASIBLE BUT NOT DESIRABLE
- CUSTOM SYSTEM IS FEASIBLE AND MAY SOLVE PROBLEM

RECOMMENDATION

- ADVOCATE THE CUSTOM SYSTEM CONCEPT
- ESTABLISH A JOINT SPO/AFSP/AFPRO/LMSC WORKING GROUP
- BRIEF OR WRITE LETTER TO GENERAL FERGUSON - COORDINATE OR COPY TO GENERAL MARTIN

AGENA

CONTRACT STRUCTURE

- PRIOR TO 1965
  - PRIME CONTRACT TO LOCKHEED
  - COST PER VEHICLE: $ .901M
  - NO CONTRACTUAL DESIGNATION
    - CENTRALIZED INTERFACE CONTROL
    - HARDWARE INTEGRATION
- POST 1965
  - ASSOCIATE CONTRACT STRUCTURE
    - LMSC - VEHICLE
    - BAC - ENGINE
    - BAC - VELOCITY METER
    - BEC - HORIZON SENSOR
  - COST PER VEHICLE: $.[illegible] - .[illegible]M
  - NO CONTRACTUAL DESIGNATION
    - CENTRALIZED INTERFACE CONTROL
    - HARDWARE INTEGRATION

CONTRACT STRUCTURE

- OBJECTIONS TO CURRENT STRUCTURE
  - GFP TO SP CAUSES INCENTIVE CONTRACTING PROBLEMS
  - NUMBER OF CONTRACTS CAUSES UNACCEPTABLE SPO WORKLOAD
  - LACK OF CLEAR DESIGNATION OF RESPONSIBILITY CAUSES:
    - CONTINUAL QUESTIONS
    - LOST TIME AND EFFORT
    - INCREASED COSTS TO REPAIR ERRORS

- PLANNED ACTIONS
  - RETURN TO PRIME STRUCTURE AT LEAST BY NEXT PRODUCTION CONTRACT
  - DESIGNATE LMSC
    - CENTRALIZED INTERFACE CONTROL CONTRACTOR
    - HARDWARE INTEGRATION CONTRACTOR

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AGENA D

RECOMMENDATIONS

- APPROVE IN PRINCIPLE RETURNING TO PRIME CONTRACT STRUCTURE.

Agen. 3

PROJECT COUGH DROP

- INTERIM INCREASED CONFIDENCE ACTIONS
  - USE "D" OIL AT ALL SITES
  - OIL FLUSH AT ALL LAUNCH SITES
  - TIGHTEN CURRENT SEAL SPECS
  - IMPROVE CURRENT BEARING CLEARANCE
  - IMPROVE GEAR TOOTH FINISH
  - RETROFIT PUMPS WITH "LOOSE" CLEARANCE BEARINGS
  - INSTALL FLIGHT INSTRUMENTS ON 12 VEHICLES FOR VERIFICATION
  - INITIATE VERTICAL ACCEPTANCE TEST AT BAC
- PHASE II TEST PROGRAM UNDERWAY
- RETROFIT OF 5 NASA VEHICLES
- ADDITIONAL LMSC AND BAC RECOMMENDATIONS
  - IMMEDIATE RETROFIT TO ELIMINATE INVINCIBLE GEARS, INSTALL LOOSE BEARINGS AND NEW SEALS

[illegible]

JOHNSON COMMITTEE GROUND RULES

		ACCOMPLISHED	
		YES	NO
1.	A DX PRIORITY IS ASSIGNED THE S-OIA PROGRAM	✓	
◇ 2.	THE ENGINEERING SYSTEM SHALL BE SIMPLIFIED, REQUIRING ONLY THOSE DRAWINGS ESSENTIAL TO TOOL, BUILD & SERVICE VEH.	✓	
3.	FINAL CONFIGURATION FREEZE SHALL BE ACCOMPLISHED	✓	
4.	ENGINEERING PERSONNEL SHALL BE LOCATED IN AN ENCLOSED AREA IMMEDIATELY ADJACENT TO THE TOOLING & MFG AREA	✓	
5.	A RAPID DRAWING RELEASE SYSTEM (24 HOURS MAXIMUM) FROM THE PROJECT ENGINEERS APPROVAL TO THE MANUFACTURING GROUP SHALL BE ESTABLISHED	✓	
6.	FUNDING SHALL BE ADEQUATE AND TIMELY	NOT ON QTR'LY BASIS	
7.	TECHNICAL DIRECTIVE MEETINGS INVOLVING LARGE GROUPS SHALL NOT BE REQUIRED. AIR FORCE PERSONNEL SHALL WORK IN CLOSE LIAISON WITH THE LMSC PROJECT ENGINEER SO FORMAL MEETINGS ARE NOT REQUIRED	✓	

P-16185 "S OIA" 5-16-63
CY S-1

JOHNSON COMMITTEE GROUND RULES

		ACCOMPLISHED	
		YES	NO
8.	REASONABLE OVERTIME WILL BE APPROVED. AFTER-THE-FACT APPROVAL IS NOT PRECLUDED. (PURSUANT TO CLAUSE A-37 OF THE CONTRACT)	✓	
◇ 9.	AIR FORCE APPROVAL OF VENDOR SELECTION SHALL BE FURNISHED ON-THE-SPOT AT SUNNYVALE. WHEN SINGLE SOURCE PROCUREMENT IS NECESSARY, JUSTIFICATION OF SUCH ACTION WILL BE KEPT ON FILE.	✓	
◇ 10.	TOOLING SHALL BE OF THE SIMPLEST TYPE THAT WILL ACHIEVE INTERCHANGEABILITY AS STATED IN THE BASIC S-01A SPECIFICATION. NO TOOL DRAWINGS OR OUTSIDE APPROVAL OF TOOLING WILL BE REQ'D	✓	
11.	INTERCHANGEABILITY ON EARLY S-01A'S WILL BE LIMITED TO MAJOR STRUCTURAL AND EQUIPMENT ITEMS. DOORS, FOR INSTANCE, MAY REQUIRE TRIM TO FIT.	✓	
12.	NO ENGINEERING ANALYSIS REPORTS WILL BE REQUIRED, SINCE IT IS RECOGNIZED THAT BASIC ENG'RG RPTS FURNISH COMPARABLE DATA.	✓	
13.	THE AIR FORCE PROGRAM DIRECTOR AND LMSC SHALL JOINTLY REVIEW THE SPECIFICATION PROBLEM & AGREE AT THE CONFIGURATION CONFERENCE TO REDUCE THE NUMBER INVOLVED TO THE MINIMUM COMPATIBLE WITH THE S-01A MISSION.	✓	

P-16106 "S-01A" 5-16-63
CY 5-1

STANDARD AGENA

PHASE I STANDARDIZATION (S-01A)

- USE OF FLIGHT PROVEN AGENA B EQUIPMENT.
- STANDARDIZATION OF MAJOR EQUIPMENT CIRCUITS & PLUMBING.
- MODULARIZED SUBSYSTEMS FOR INTERCHANGEABILITY & SIMPLIFIED CHECKOUT

INTERMEDIATE IMPROVEMENT (ABC) (S-01B)

- PIP
- 8247 ENGINE
- BTL
- UPA AND UPC

PHASE II MAJOR ORBITAL RELIABILITY IMPROVEMENT PROGRAM

STANDARD AGENA

STANDARD AGENA PROGRAM

ABC FEATURES (1963)

☐ *INCREASED PAYLOAD CARRYING CAPABILITY*
  95 LBS SPECIFIC SINGLE BURN MISSION
  100 TO 135 LBS DUAL BURN MISSION

☐ *INCREASED VERSATILITY*
  8247 MULTISTART ENGINE
  ADDITIONAL INSTRUMENTATION CAPABILITY

☐ *INCREASED ORBITAL CAPABILITY*
  DEACTIVATE/REACTIVATE VEHICLE ON COMMAND

☐ *IMPROVED INJECTION ACCURACY*
  BTL GUIDANCE SYSTEM IN AGENA

☐ *ADDITIONAL OPTIONAL KITS AVAILABLE*

☐ *PERMITS ELIMINATION OF PROGRAM AUXILIARY FORWARD SECTION*

☐ *ELIMINATES PROGRAM MODIFICATIONS TO AGENA BASIC WIRING*

P-17567 "STANDARD AGENA" 9-5-63
CY 5-1

[illegible] MISSILES & SPACE COMPANY

AGENA UPDATING ACTIVITIES

STANDARD AGENA PROPOSALS - (ABORTED)

- ○ IMPROVED GUIDANCE MODULE (IGM) ______ PROPOSED: '62 & '63
  WOULD HAVE AVOIDED GIP & DACS ______ REJECTED: 11/63
- ○ LONG-RANGE IMPROVEMENT PROGRAM ______ (PHASE I) PROPOSED: '64
  3 PHASE - 19 MONTH - ALL SUBSYSTEMS ______ REJECTED: 6/65
- ○ GUIDANCE & CONTROL ELECTRONICS (GCE) ______ DEV INITIATED: 9/66
  WOULD ELIMINATE GIP & COMPAT. WITH RACS ______ STOPPED: 3/67
- ○ ELECTRONIC EVENT TIMER (EET) ______ STUDY INITIATED: 1/66
  REPLACE SEQUENCE TIMER ______ DEV. STOPPED: 6/67

USING PROGRAM ACTIONS

- ○ GUIDANCE INTERCONNECT PACKAGE (GIP) - PROG. 846 ___ DEV. INITIATED: 6/65
  REPLACES STD. AGENA GUID. & F/C J-BOXES
- ○ DUAL ATTITUDE CONTROL SYSTEM (DACS) - PROG. 110 _ DEV INITIATED: EARLY '67
  REPLACES STD. AGENA GUIDANCE EQUIPMENT

CURRENT PROBLEM

BASIC : USING PROGRAMS TEAR DOWN AND REBUILD - INVALIDATE TEST

EXAMPLES:

[redacted]	846	[redacted]
[redacted]	REMOVE: FLT. CONTROL J-BOX GUID. J-BOX (9) HARNESSES DRILL, CUT, ETC, TO ACCOMODATE PROG. EQUIP. ADD (AGENA SYS.) GUID. INTER. PKG. SEQUENCE TIMER RECOVERY TIMER DC CONVERTER (REDUNDANT) AUX. FM TELEMETER FLT. LOGIC & PROGMR BOX (7) HARNESSES ADD (OTHER). (25-30) PROG. BOXES) (30) HARNESSES	[redacted]

RECENT PROPOSED SOLUTIONS

SAFSP CONSIDERATION

- ELIMINATE STD. AGENA

[redacted]

SSV PROPOSAL (CONCEPT I)

- ESTABLISH BASIC AGENA IN LIEU OF STD. AGENA
- ASSEMBLE COMMON EQUIPMENT PLUS CERTAIN PROG. ADD-ONS
- SYSTEM TEST & CONDITIONAL DD-250

LMSC - SIMPLIFIED AGENA (BASIC)

- ASSEMBLE & TEST TO POINT OF COMMON USAGE
- TRY TO MAINTAIN BASIC ASCENT AGENA CAPABILITY

JOINT LMSC/SAMSO - CUSTOMIZED AGENA

- ONE TIME BUILD UP - INCLUDE PROG. STRUCT. & HARNESSES
- INSTALL AGENA & PROG. EQUIPS. TO COMPLETE VEHICLE SYSTEM
- ACCEPTANCE TEST & CONDITIONAL DD-250
- ORGANIZE REQ'MTS & CONTRACT RESPONSE

CUSTOMIZED STD. AGENA

PURPOSE.

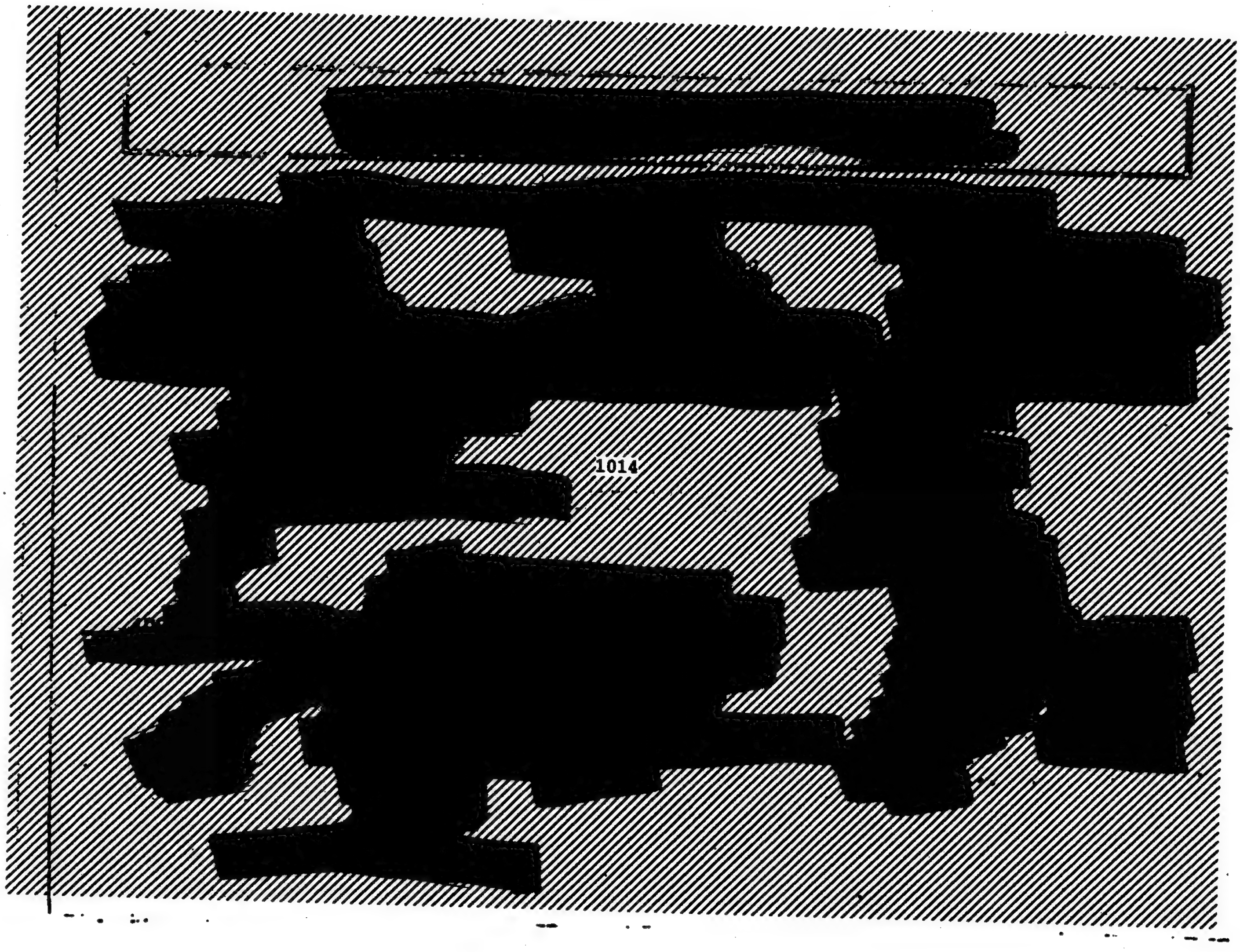
MODIFY STD. AGENA/PROG. ASSEMBLY & TEST SEQUENCE TO MEET PROG. REQUIREMENTS

OBJECTIVES.

IMPROVE SYSTEM RELIABILITY
- ○ ELIMINATE DRILLING, CUTTING, ETC., AFTER HARNESS & BOX INSTALLATION
- ○ MINIMIZE HARNESS DISCONNECT & FLEXING
- ○ OPTIMIZE SEQUENCE OF VEHICLE ASSEMBLY (FROM CORE-CUT)

IMPROVE OVERALL SCHEDULE
- ○ DEVELOP LOGICAL ONE-TIME VEHICLE BUILD-UP
- ○ REDUCE LEAD TIME FOR IMPLEMENTATION OF DESIGN CHANGES

REDUCE TOTAL RECURRING COST
- ○ ASSEMBLE VEHICLE UNDER OPTIMUM ACCESSIBILITY CONDITIONS
- ○ ELIMINATE UNNECESSARY VEHICLE BUILD-UP & TEAR DOWN, AND TEST INVALIDATION.
- ○ ELIMINATE SLAVE HARDWARE


1014

[redacted]

[redacted]

REQUIRED ACTIONS

[redacted]

- ○ USAF & LMSC ESTABLISH SENIOR REQUIREMENTS PANELS
- ○ MODIFY STANDARD AGENA CONTRACT TO PROVIDE DELIVERY OF CUSTOMIZED VEHICLES AND TO PERMIT RESPONSIVENESS TO PROGRAM REQUIREMENTS
- ○ SIMPLIFY CHANGE CONTROL REQUIREMENTS

PROPOSAL FOR CUSTOMIZED AGENA

- SUBMITTAL FOR PROGRAM 846 VEHICLES.. ___8-15-67

[redacted]

- PROPOSALS TO INCLUDE:
  - PART I SPECIFICATION FOR EACH VEHICLE
  - PART II SPECIFICATION FOR EACH VEHICLE
  - EQUIPMENT LIST (ECL) FOR EACH VEHICLE
  - INBOARD PROFILE DRAWING FOR EACH VEHICLE
  - MANUFACTURING PLAN FOR EACH VEHICLE
  - ACCEPTANCE TEST PLAN FOR EACH VEHICLE
  - DETAILED SCHEDULES
  - COST ANALYSIS
  - REQUIRED CONTRACT & CONFIGURATION CONTROL REQUIREMENTS

EXPECTED RESULTS

- MAINTAINS RELIABILITY TREND OF STANDARD AGENA
- ELIMINATES TEAR DOWN & REWORK & REPLACEMENTS
- INCREASES REL. CONFIDENCE IN USING PROGRAM CONFIGURATION
- SHORTER OVERALL SCHEDULES
- LOWER TOTAL COSTS
- PROVIDES FLEXIBILITY & VERSATILITY TO AGENA

STANDARD AGENA STATUS - JUNE '67

USING PROGRAM COMPLAINTS

- UNNECESSARY TEAR DOWN, REBUILD & RETEST
- DIFFICULT HANDLING AS GFP AFTER DD-250
- SLOW AGENA RESPONSE
- NO AGENA FLIGHT RESPONSIBILITY

PROPOSAL: ELIM. STD AGENA - DELIVER ENGINE & TANK PLUS "BUCKET OF BOLTS".

STANDARD AGENA COMPLAINTS

- LACK OF TIMELY REQ'MTS FROM PROGRAMS
- UNECESSARY CHANGES, LITTLE COORDINATION
- LOWER PRIORITY, SHORT FUNDING
- DIFFERENT MGM'T GRD. RULES (AFSC VS. S.P.)

PROPOSAL: CUSTOMIZE AGENA TO PROGRAM REQ'MTS

- ONE TIME BUILD UP & TEST
- SR. REQ'MTS PANEL - LMSC & AF
- DELAY DD-250, CPIF, PERF. INCENT.
- COMMON MGM'T GRD. RULES, REDUCE SPECS.
- EQUIV. PRIORITY & COORD. FUNDING

RESULT: RETAINS RELIABILITY ADVANTAGE
MAINTAINS AGENA CAPABILITY FOR OTHER USERS
PROVIDES FLEXIBILITY & VERSATILITY
REDUCES TOTAL COST & OVERALL SCHEDULE

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[illegible] in your [illegible] Briefing on Agena Procurement, [illegible] procuring such items as [illegible] with SAFSP performance [illegible] the Agena Program [illegible] of returning to a prime con- [illegible] LMSC [illegible] procurement management [illegible] for the Agena D as GFE [illegible] procurement of horizon sensors [illegible] out of these components [illegible] D vehicles has already been made. Imple- [illegible] to procure engines CFE could be [illegible] production buy for 19 Agena D vehicles and [illegible] the following actions:

a. [illegible] approval of Request to deviate from AFR 70-9, which defines the [illegible] a Category 2 (associate) procurement.

b. Dr. [illegible] approval of a revised Determination and Findings (D&F) and [illegible]

[illegible] LMSC production contract to include procurement of engines. [illegible] LMSC inputs, we estimate an increase of $31,000 to $42,000 [illegible] over what we are now paying for CFE engines.

[illegible] Aerosystems Co (DAC) for 19 [illegible] submitted to SMVA.

[illegible] Engine delivery schedule [illegible] In order for LMSC to [illegible] the first three actions [illegible] call your attention to the above actions and associated schedule [illegible] because your strong support would be required to help meet [illegible] dates. Specifically, the expeditious processing of the D&F [illegible] your personal independent [illegible] fulfill your desire [illegible] subsystems. Nevertheless, [illegible] appreciably strengthens your [illegible] the fact that increased costs [illegible] this action deviates from current procurement procedures as outlined in AFR 70-9, I will not approve the move without your full cooperation and support.

4. I would appreciate your thoughts on this matter.

SIGNED

PAUL T. COOPER
Major General, USAF
Deputy Commander for Space

CONFIDENTIAL

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11 [illegible] 1967

[illegible] Col Hamilton LtCol Poor/32288

[illegible]

[illegible] your letter of 23 June 67, Subject: Improved [illegible] that you requested and obtained approval [illegible] boosted test load for the Improved Agena [illegible] for conducting the overall system engineering, [illegible] /AFSC would also be responsible for payload [illegible]

I certainly concur as to the desirability of such a flight, which now becomes possible with the schedule relaxation approved by Dr. Flax. I further consider the flight test to be a logical extension of the Agena development program. As such, the test flight must have as its primary objective the verification of the Agena performance parameters as identified in the development criteria. All other objectives must be secondary. Flight instrumentation to measure performance parameters, or in the event of failure, to provide sufficient diagnostic data to analyze and correct the failure is a vital part of the test program. I consider that the Agena Program Office must share responsibility for the overall conduct of the test flight and in that role have responsibility for the identification and installation of vehicle instrumentation as well as analysis of flight data. In the case of a flight anomaly, the need for the Agena Program Office to share responsibility for the test flight is particularly emphasized, since that office as the developing agency would be responsible for analysing and resolving the problem as was the case with the Gemini Agena Target Vehicle first flight engine failure.

[redacted]

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DECLASSIFIED AFTER 12 YEARS.
DOD DIR 5200.10

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[redacted]

SIGNED

[illegible]
[illegible]
[illegible]

CONFIDENTIAL

CONFIDENTIAL

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14 August 1967

[illegible]

Improved Agena Flight Test

[illegible] (General Cooper)

1. Reference your letter on above subject, dated 11 August 1967.

[redacted]

3. I do not agree to joint or shared responsibility for the test flight; the flight must be prepared and conducted under unequivocal assignment of specific responsibilities. Except as clarified in paragraph 2, above, these responsibilities are assigned in my 23 June letter on the same subject. We will, of course, work closely with the Agena SPO in planning and carrying out this important flight, and will welcome their assistance in analyzing any Agena flight anomaly which may occur.

SIGNED

JOHN L. MARTIN, JR.
Brigadier General, USAF
Director

CONFIDENTIAL

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25 Aug 67

[illegible] Production Management Concept for Agena

[illegible] (Gen Martin)

1. Based on the meeting which you had with Col Hamilton and the Agena Program people on 18 August 1967, it is my understanding that you still desire that customization of the Agena for your programs be performed by your office rather than the Agena Program Office. The Agena Program Office will be responsible for procurement and assembly of the Agena only to that point in the assembly line which would be common to all your programs. In order to readjust the Agena office functions as well as amend the contracts for procurement and assembly of components, we will need a determination from you as to the location of this point.

2. While there will normally be no requirement for system testing on our part, in order to verify that the portion of the equipment for which we are responsible meets the specifications, some testing will be required.

3. I am anxious to have this matter resolved by the preparation of a mutually agreeable plan. Our Agena program people are ready to meet with your people to work out the details of such a plan.

SIGNED

PAUL T. COOPER
Major General, USAF
Deputy Commander for Space

~~CONFIDENTIAL~~

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[illegible]
[illegible]
[illegible]

30 August 1967

REPLY TO ATTN OF: SP-1

SUBJECT: Improved Agena

TO: SMG-2 (General Cooper)

[redacted]

3. In my view there are three general areas in which the cost increases are not justified:

a. The first is an apparent tendency to over-engineer both the hardware improvements and the test philosophy, imposing an extremely conservative engineering approach, with introduction of many new components (for example: injector, pump and thrust chamber in the N_2O_4 engine) and an exhaustive test program (for example: a requirement to test burn the ISPS 12 times without refurbishment, versus the 2-burn normal PFRT case). In some cases, the improved Agena is being designed to requirements considerably in excess of those furnished by SAFSP in July (for example: 60-day wet pad capability versus our 30-day requirement and 90-day on-orbit capability versus our 20-30 day requirement with a 45-day objective).

b. The second area is the generation of voluminous paper work, which is not absolutely necessary. While some of this paper may be beyond our control to eliminate, e.g. the C/S PCS requirement, others (full 375-1 documentation, formal test plans and operability plans, changing all drawings to MIL-D-1000 Form 2) seem to me to go far beyond the documentation really required, especially when this question is considered in full

[illegible] paper [illegible]

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context of the actual manner of employment of these vehicles (substantial modification by the same contractor prior to use, consumption without entering the inventory in the normal sense, all launch preparations and services by the same contractor, etc.)

c. The third area is smaller in dollar impact at present, and involves the investigation of sub-systems other than propulsion and structures. The stated objective of the Improved Agena was to introduce the N_2O_4 engine with modification of plumbing and structures as required. The current plan contemplates study of electrical, guidance, TT&C sub-systems and optional kits. While I agree that study of these items may well be required later, they are not part of the original concept which we discussed with Dr. Flax and upon which his approval to proceed was based.

Not true - told Bing Smith no -

4. I believe that we can and must scrub the current concept down to eliminate the effort that is not absolutely essential. I have attached a budget breakdown which shows in three columns the original cost estimate, the current cost estimate and a preliminary SAFSP estimate of a more reasonable approach, based upon elimination of work not necessary to meet our requirements. I hope we will be able to reduce this further. My people are looking into this in some detail and will work with the Agena Program Office as required.

JOHN L. MARTIN, JR
Brigadier General, USAF
Director

1 Atch
Improved Agena Estimates

CC: SMV (Col Hamilton) ✓

IMPROVED A NA ESTIMATES
(in thousands)

	LMSC/SAMSO Agena Office		
	Original	Present	SAFSP*
LMSC			
Labor	[redacted]	[redacted]	[redacted]
Program Management	[redacted]	[redacted]	[redacted]
C/S PCS	[redacted]	[redacted]	[redacted]
System Integration	[redacted]	[redacted]	[redacted]
Vehicle Engineering	[redacted]	[redacted]	[redacted]
Propulsion	[redacted]	[redacted]	[redacted]
Structural	[redacted]	[redacted]	[redacted]
R&D	[redacted]	[redacted]	[redacted]
Other	[redacted]	[redacted]	[redacted]
Tests and Test Articles	[redacted]	[redacted]	[redacted]
DTV	[redacted]	[redacted]	[redacted]
Propulsion	[redacted]	[redacted]	[redacted]
Structural	[redacted]	[redacted]	[redacted]
Other	[redacted]	[redacted]	[redacted]
Studies	[redacted]	[redacted]	[redacted]
Stretchout	[redacted]	[redacted]	[redacted]
sub-total labor	[redacted]	[redacted]	[redacted]
Material	[redacted]	[redacted]	[redacted]
Facilities	[redacted]	[redacted]	[redacted]
LMSC in-house	[redacted]	[redacted]	[redacted]
Major sub-contractors (except engine)	[redacted]	[redacted]	[redacted]
LMSC Burden/Fee on all subs (incl engine)	[redacted]	[redacted]	[redacted]

25/ej

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Bell Engine sub-contract

Eng dev and test	[redacted]	[redacted]	[redacted]
System support	[redacted]	[redacted]	[redacted]
Operability	[redacted]	[redacted]	[redacted]
Program mgt and C/S PCS	[redacted]	[redacted]	[redacted]
Stretchout	[redacted]	1044	[redacted]
Facilities	[redacted]	[redacted]	[redacted]
TOTALS....	[redacted]	[redacted]	[redacted]

*On 28 August LMSC and the SAMSO Agena Program Office presented to SAFSP a description of the work planned for Phase II of the Improved Agena program, together with the cost estimates shown in the middle column above. The cost estimates in the right hand column reflect SAFSP preliminary estimates, made in the 2 days subsequent to the briefing, of these items of work which could be eliminated and/or reduced in scope because they were not necessary to meet SAFSP requirements.

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

306a

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS SPACE AND MISSILE SYSTEMS ORGANIZATION (AFSC)
AF UNIT POST OFFICE, LOS ANGELES, CALIFORNIA 90045

[illegible]

SMG-2

Improved Agena (U)

SMGS (General Martin)

1. Reference your letter of 30 Aug 67, same subject. The cost estimate of [redacted] based on a scope and depth of effort over which there is significant disagreement and misinterpretation, and my Agena Program Office does not concur with that estimate. We have been authorized to proceed with the program outlined in Option B of SSVA letter to AFSC, dated 6 Jun 67, Subject: Improved Agena Schedules and Funding. The Phase II cost estimate for Option B was [redacted] of which [redacted] was for SE/TD support from Aerospace Corporation. Your office was informed of this new estimate prior to the time that they briefed Dr Flax on your recommended course of action for Agena management. In the same time period, I briefed General Ferguson on the new estimate and told him that I was concerned that Dr Flax might have some second thoughts concerning the improved Agena in view of the large increase in program cost. I am disturbed that although you have had this information since last June you are expressing alarm at this late date.

2. The time phasing of our funds was spelled out in Option B and the program will be conducted within those constraints. We have been assured that there is no possibility of obtaining additional funds in FY 68 and we are also aware that fiscal 69 will be a problem. Our development program will be tailored to meet these fiscal limitations and at the same time maintain the first delivery date of March 1970.

3. I am alarmed by the degree of misleading and, in some cases, incorrect information which has apparently been given to you on the Improved Agena Program. I will address each of the points in your paragraph 3:

a. "Tendency to over-engineer" - It is our intent to do a sound engineering job which will result in reliability of the Agena E comparable to Agena D. We are not redesigning anything unless it is required. You mentioned three examples of components which you felt did not require redesign:

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(1) Injector: In addition to resizing the holes in the injector for the new propellants and the new mixture ratio, some additional modification has been shown to be necessary in order to correct a dynamic instability problem and to optimize the injector pattern in order to achieve the predicted performance increase with the new propellants.

(2) Pump: The degree of redesign of the turbine pump has been significantly influenced by the "Cough Drop" problem on Agena D. This was recognized and included as a basic ground rule for all options of the SSVA letter to AFSC dated 6 Jun 67.

(3) Thrust chamber: The length of the chamber has to be shortened in order to accommodate the increased expansion ratio of the nozzle and fuel will be used for cooling the chamber instead of oxidizer (N_2O_4 is not suitable). In addition, the thrust level is being increased by 12.5%. These changes are mandatory and have been recognized from the very beginning of the program.

b. "Exhaustive test program" - The degree of testing required to achieve our program goal has not yet been finalized. The initial Lockheed proposal was clearly inadequate. The degree of testing proposed by Aerospace would assure us a highly reliable engine, but we may choose to accept a higher risk in order to keep program costs within bounds. For your information, MIL-R-5149B specifies 12 full duration runs as the test requirement for full qualification, and 6 full duration runs as the test requirement for PFRT. Two full duration runs are neither normal nor adequate for PFRT.

c. "Requirements considerably in excess of those furnished by SAFSP" - The 60-day wet pad capability and 90-day on-orbit capability were in the development plan which was approved for implementation prior to receipt of SP-2 letter dated 7 Jul 67 spelling out SAFSP requirements. SMVA letter to SP-2, dated 17 Aug 67, requested clarification of SAFSP requirements and asked for your recommendation on the desirability of continuing with the 60/90 day requirements versus reducing our design goals to the level required by SAFSP. The answer to this latest letter was received today and we will adjust these requirements accordingly.

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d. "Voluminous paper work" -

(1) C/S PCS: Lockheed is stubbornly resisting C/S PCS, but we seem to have no choice but to include it as a requirement. They have undoubtedly over-priced this item in an attempt to scare us off.

(2) "Full 375-1 documentation": This is not really true. We are levying only 12 of the 18 Exhibits of AFSCM 375-1. We are also being as liberal as possible in the application of 375-1. For example, only those specifications which are substantially affected by design changes will be rewritten, and only those drawings which are new or substantially changed will have to conform to MIL-D-1000.

1210

(3) "Formal test plans and operability plans" - These plans are necessary to the conduct of the program. Making them "formal" is admittedly a thorn to the contractor because it gives the Agena Program Office better visibility and control, thereby assuring more complete design verification and giving a better yardstick for estimating program costs.

e. The current plan does not include study of other subsystems such as electrical, guidance, TT&C and optional kits other than the single start kits. However, it may be necessary to make certain changes to these subsystems in order to make them compatible with the new propulsion subsystem. The Agena Program Office has recommended to your people that a review of these subsystems be accomplished at a later date. Serious consideration is also being given to elimination of the single start kit since the slight weight savings does not appear to justify the development cost.

4. I am concerned about your statement that you are having your people look into this in some detail, and I hope that our differences with Lockheed will not be further aggravated by your unilateral discussions with them concerning the scope of the development program. I am confident that my Agena Program Office is capable of managing the Agena E Development Program, both technically and financially.

SIGNED

PAUL T. COOPER
Major General, USAF
Deputy Commander for Space

~~SECRET~~

DEPARTMENT OF THE AIR FORCE
DIRECTORATE OF SPECIAL PROJECTS (OSAF)
AF UNIT POST OFFICE, LOS ANGELES, CALIFORNIA 90045

8 September 1967

306G

REPLY TO
ATTN OF: SP-1

SUBJECT: New Production Management Concept for Agena (U)

TO: SMG-2 (General Cooper)

1. (U) Your letter of 22 August asked me to determine the point on the standard Agena assembly line at which the vehicle would be common to all my using projects.

2. (U) We have addressed this question in the following steps:

a. First, we determined for each using project the optimum configuration for delivery from the standard line to SAFSP, with "optimum configuration" defined as:

(1) One from which nothing must be removed during the peculiarization process, and

(2) One on which the peculiarization process inflicts no potential reduction in reliability (as, for instance, installing components in an awkward sequence, requiring holes bored after assembly of some interfering components has already been completed, undue strain on harnesses already installed, etc.).

b. Second, we compared all the optimum configurations and determined the point of commonality.

3. ~~(C)~~ As has been previously pointed out, the truly common point is very early on the assembly line, because of the quite different peculiarization processes. Atch 1 describes this common point. Four different optimum configurations are required: that is, my using projects should take delivery at separate places on the standard Agena line, with a considerable spread between the earliest point and the latest point.

4. ~~(S)~~ In quantitative terms, I have firm requirements as of 5 September for 49 more Agenas not yet delivered by SAMSO. Of these:

a. 18 are either already built and in storage prior to delivery to SAFSP, or are in late stages of manufacture. At this point, it is more cost-effective to deliver these 18 in the current standard configuration.

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~~SECRET~~

b. Delivery of the remaining 31 would be more cost-effective, from the overall Government standpoint, in four different configurations. Listed below is the order in which these vehicles would come off the standard Agena assembly line, together with the number of vehicles of each type remaining to be manufactured to meet present firm program requirements:

[redacted]

5. (U) Attachments 2 through 6 are summaries for each of these four projects, (plus a fifth project to which all required Agenas have already been delivered) showing firm quantitative requirements for Agenas yet to be delivered, desired change-over points (in terms of specific standard Agenas by tail number) from current standard Agena configuration to the optimum configurations, and descriptions of the optimum configurations for each project. Allocations of specific standard Agenas to projects have historically been subject to change; however, the tail numbers shown will provide a base line for planning.

6. ~~(S)~~ I am concerned that the actions which have been taken and apparently are being taken by SAMSO on this problem continue to be at cross purposes with the actions recommended by SAFSP as the sole user of the vehicle in question. As a background, the following is a summary of the substance of the principal recommendations I submitted in May, after review with you, to Dr. Flax and subsequently briefed to Dr. Flax on 6 June, and to Gen Ferguson, Gen Stewart and you on 7 June:

a. Dr. Flax obtain from DDR&E:

(1) Approval to change the standard Agena concept from one of producing completely assembled and tested vehicles to one of producing components and sub-assemblies.

(2) Delegation to Dr. Flax of approval authority for production of the components and sub-assemblies.

b. After DDR&E approval is obtained, Dr. Flax direct:

(1) Immediate action to modify standard Agena production contracts to:

(a) Stop manufacture of components not used by SAFSP

(b) Stop (complete) assembly and system test of standard Agenas.

(c) Remove 375-series configuration control procedures and substitute therefor an SAFSP configuration management plan.

(2) Immediate action to modify the SAMSO Agena logistics contract to vest in SAFSP the sole approval authority over stores issue, determination of component flight worthiness and disposition of items not flight worthy.

(3) Planning and execution on an orderly basis of the remaining changes required in SAMSO or AFCMD responsibilities, organizations and contracts to implement above.

(4) Continue development of the Bell 8533 engine (but restudy the time phasing in view of SAFSP budget recommendation that it be incorporated in Project 110 vehicle #37 in Feb 1971 rather than in #23 in Apr 1969), the Bell Type IIA velocity meter, the LMSC electronic event timer and the Quantic horizon sensor.

(5) Review other proposed Agena developments with SAFSP to determine requirements before proceeding with development work.

(6) Planning and execution on an orderly basis of the remaining changes required in SAFSP responsibilities, organization and contracts to implement above.

7. ~~(C)~~ It was my understanding at the time of making the above recommendations to Dr. Flax and Gen Ferguson that Dr. Flax would await Gen Ferguson's comments before taking action, and that, he, in turn, would await comments from you. I am not aware of any comments to Gen Ferguson on these recommendations (except for Gen Stewart's, made in his 14 June letter), and as far as I can tell, the action is still

being held up in anticipation of your comments. The delay in getting approval to proceed on the recommended basis has left no alternative but for SAFSP to proceed with several contractual actions on the present standard Agena basis instead of on the recommended basis, which will unavoidably result in some lost motion in implementing any change. I have also necessarily deferred action on the CFE engine question raised in your letter of 2 August, since the feasibility of introducing the CFE/incentive contract approach in lieu of the present engine procurement arrangement is directly related to when and if we can get approval for the changes I have recommended and how many vehicles are left to buy at that point. In addition, I cannot see that the delay that has occurred has produced any useful result: the problem and the solution are the same as when the SAFSP recommendations were submitted in May, nothing substantive has changed at all except to impair the effectiveness of initiation of the recommended change. As we pointed out in the May recommendations and discussions and June presentations, the details of implementation will necessarily require several months after approval to proceed. These details will not affect the nature of the solution, and continued delay of the basic decision in attempts to work them all out in advance can only result in more vehicles being built under the present arrangements, with attendant waste of manpower and money.

8. (U) In summary, I am anxious to get approval to proceed as soon as possible and solicit your support. I hope that the data forwarded herewith will enable you to resolve any questions which remain. If not, I am ready for any further discussions which you may desire.

9. (U) This letter is classified SECRET because it reveals level of effort and projected plans on sensitive programs.

JOHN L. MARTIN, JR
Brigadier General, USAF
Director

6 Atch
1. Common Config
[redacted]

cy to: SMV (Col Hamilton)

~~SECRET~~

386e

[redacted]

18 September 1967

MEMORANDUM FOR GENERAL O'NEILL

SUBJECT: New Production Management Concept for Agena (U)

1. The essence of the 15 September SAFSP letter to Flax is contained herein except that John Martin is now recommending a complete transfer of the Agena responsibility to SP at a certain date.

2. My memo to John Martin (attached) dated 22 August, in effect, capitulates to his recommendations and I do not understand why his 8 September letter still deplores the delay because we are ready to proceed. A misunderstanding obviously exists as to the requirement for us to state our views with Ferguson. I called Russ Berg and he, too, is of the opinion that Flax is waiting on Ferguson and he prepared a note for Flax to send, asking for the Ferguson comments.

3. I called Gen Ferguson and told him that "under the circumstances I think the best course of action is to accept the SAFSP recommendations including the new recommendation to transfer all of the Agena work at a certain date." I offered a briefing on the details and he said that he would call Flax and if a briefing is necessary, he would advise.

PC

PAUL T. COOPER
Major General, USAF
Deputy Commander for Space

2 Atch
1. SP-1 ltr to SMG-2, 8 Sep 67 (Secret - SP-1-12)
2. SMV ltr to SAFSP, 22 Aug 67 (Uncl)

Copy to SMV (Col Hamilton)

#22

CLASSIFICATION OF THIS DOCUMENT WILL BE DOWN GRADED TO Confidential UPON REMOVAL OF ENCLOSURE #1

DOWNGRADED AT 3 YEAR INTERVALS;
DECLASSIFIED AFTER 12 YEARS.
DOD DIR 5200.10

SMG-67-23

~~SECRET~~ ~~CONFIDENTIAL~~

Cy #2

[redacted]

307

[illegible]

MEMO FOR THE RECORD

Subject: Custom Agena Briefing to Gen Martin

1. On 18 Aug 67 Gen Martin and his staff were briefed by SMVA on the Custom Agena concept. SMVA personnel attending included Lt Col Poor, Lt Col Hedlund, Maj Crawford, Maj Bell and Maj Bradford. Col Hamilton (SMV) was also present. Gen Martin was briefed as outlined in the attached charts. Purpose of the briefing was to point out to him how the Custom Agena concept would improve responsiveness to the Using Programs and would provide them with a vehicle configuration that satisfied their requirements. It was pointed out that customizing involved three areas; namely, Production Management, Configuration Management and Contract Management. Pertinent facts pointed out in each of these areas included the following:

Production Management

Manufacturing and testing of a Custom Agena by SAMSO would involve:

a. Assembly of standard Agena and program peculiar components

b. CFE storage of the vehicle

c. Validation testing after CFE storage which would not include the current Tank V System Test, and

d. Transfer of the Using Program for program additions and final systems test prior to joint SAMSO/SP DD-250 sign off.

The detailed configuration by component and subsystems and the implementation schedule identified for each program.

Configuration Management

The principal point discussed under this topic was our plan to establish a Requirements Control Board located at LMSC and composed of members from SAMSO, SAFSP, AFPRO and LMSC. It was pointed out that we felt this was the key to making the Custom Agena concept work.

Contract Management

Implementation of the Custom Agena Plan would involve SAMSO production contracts, storage contract and the current development or engineering support contract. It would further involve close coordination with SP Procurement but presented no insurmountable problems as far as procurement is concerned.

[redacted]

2. It was pointed out to Gen Martin that we considered the Custom Agena concept to offer the best solution concerning what to build to satisfy the needs of SAFSP programs. In summary, we pointed out the conclusions outlined in the attached charts and recommended that action be taken to implement the plan.

3. Gen Martin's reaction to the briefing was as follows:

a. In summary, he rejected the plan and felt that SAMSO was not directing their attention to his recommendations made to Dr. Flax in June. He further indicated that he did not think we had even considered his recommendations. He stated that in order to clear out any misinterpretation of his original recommendations he wished to reiterate for everyone's benefit in the briefing, what he had recommended, i.e., eliminate assembly and tests by SAMSO which are either redundant or invalidated by SP assembly and systems test after they receive vehicles from Standard Agena.

b. Additionally, he made the following specific comments concerning Agena Management:

(1) SAMSO should build Agena only up to the point of commonality for all SP programs. He did not envision this as including program peculiar hardware.

(2) He considered all SAMSO testing unnecessary. He pointed out that the SP system test is all that is required.

(3) He stated his opposition to the System Requirements Board in that he felt that it would unduly complicate management of the program.

(4) He made a considerable issue over the question why we felt we could build a system including program peculiar components better than SP. It was pointed out to him that we were recommending the configurations as briefed in that we felt this best satisfied his requirements.

4. In discussing the management aspect of the overall program, it was obvious that with both SAFSP and SAMSO having responsibility for the procurement, fabrication and testing of the Agena spacecraft, the management task becomes somewhat complex. The task is further complicated by the security criteria placed upon the program. During the discussion it was suggested by Col Hamilton that because of the above situation, consideration should be given to the fact that it might be in the best interest of the Air Force if SAFSP were to assume the responsibility fpr the procurement, fabrication and testing of the Agena Vehicle. Gen Martin commented that while this was not his original recommendation, he would not be opposed to such a plan.

[redacted]

5. In summary, there were no conclusions reached as a result of the briefing other than it was quite evident that anything different from Gen Martin's original recommendations was unsatisfactory to him.

ALLEN J. POOR, Lt Col, USAF
Chief, Engineering Division
Agena Program Office

1 Atch
Briefing Charts - Custom Agena

Cy to: SMV (Col Hamilton)
w/o atch

Cy #2

18 Aug 67 to Gen Martin
by Lt Col Poor

CUSTOM AGENA

Atch 1

CUSTOM AGENA

PURPOSE OF CUSTOMIZING

- RESPONSIVENESS TO THE USING PROGRAMS
- PROVIDING A SYSTEM TO THE USER IN THE CONFIGURATION HE WANTS

CUSTOM AGENA

BACKGROUND

- 14 JULY - BRIEFING - GENERAL COOPER
  - FURTHER DEFINITION OF CUSTOM AGENA
- 15 JULY - DIRECTED LMSC TO PROPOSE AN IMPLEMENTATION PLAN INCLUDING:
  - SPECIFICATION
  - MANUFACTURING PLAN
  - ACCEPTANCE TEST PLAN
  - SCHEDULE
  - COST ANALYSIS
  - CONFIGURATION CONTROL REQUIREMENTS
- 11 AUGUST - BRIEFING - GENERAL COOPER
  - STATUS REPORT
  - LMSC TO SUBMIT DETAILED IMPLEMENTATION PLAN

[redacted]

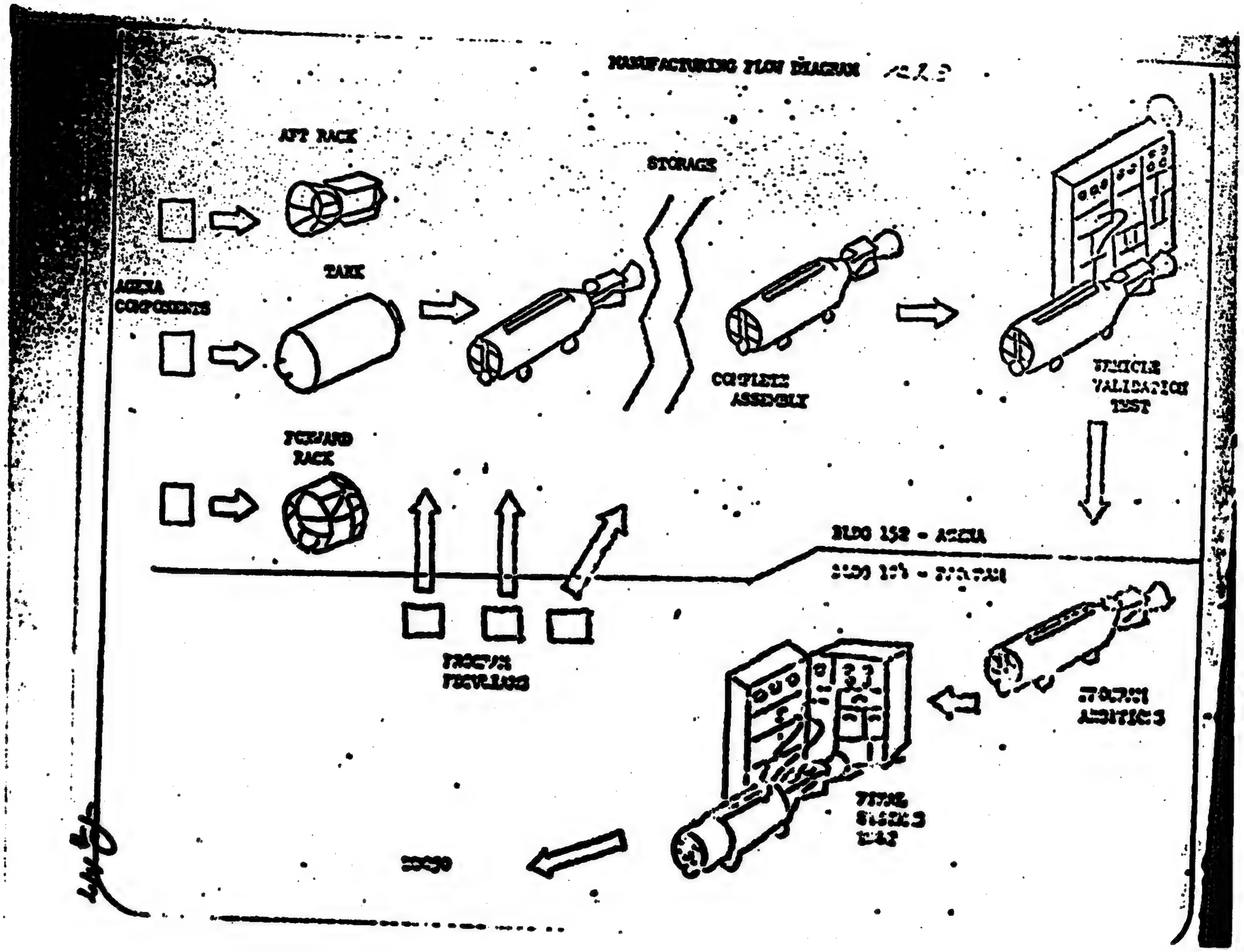
25 AUGUST 1967

15 SEPTEMBER 1967

CUSTOM AGENA

IMPLEMENTATION OF CUSTOMIZED AGENA

- ○ PRODUCTION MANAGEMENT
- ○ CONFIGURATION MANAGEMENT
- ○ CONTRACT MANAGEMENT


MANUFACTURING FLOW DIAGRAM
AFT RACK
STORAGE
AGENA COMPONENTS
TANK
COMPLETE ASSEMBLY
VEHICLE VALIDATION TEST
FORWARD RACK
BLDG 152 - AGENA

CUSTOM AGENA

PROGRAM 110

GUIDANCE AND CONTROL

AGENA COMPONENTS USED	AGENA COMPONENTS ELIMINATED	PROGRAM COMPONENTS INSTALLED
NONE	HORIZON SENSOR	HORIZON SENSOR
	VELOCITY METER	VELOCITY CUTOFF ASSEMBLY
	IRP	GYRO REFERENCE ASSEMBLIES
	FLT CONTROL ELECT	ELECT INTERCONN ASSY
	FLT CONT J-BOX	AUX ELECT INT. ASSY
	GUIDANCE J-BOX	DUAL ATTITUDE CONT. SYST
	SEQUENCE TIMER	BACK UP STAB. SYST

CUSTOM AGENA

SUMMARY OF MAJOR HARDWARE CHANGES

PROGRAM	STD AGENA COMPONENTS USED	STD AGENA COMPONENTS ELIMINATED	PROGRAM COMPONENTS INSTALLED
846	44 21 Wire/Harnesses	4 9 Wire/Harnesses	21 42 Wire/Harnesses
110	18	20 All Wire/Harnesses	24 115 Wire/Harnesses
770	40 29 Wire/Harnesses	None	7 15 Wire/Harnesses

CUSTOM AGENA

VEHICLE VERIFICATION TEST

PERFORMED

TASK I	VEHICLE HOOK-UP
TASK II	"POWER-ON" CHECK
TASK III	BACKUP EVENT VERIFICATION
TASK IV	TELEMETRY VERIFICATION
TASK V	GUIDANCE & CONTROL VERIFICATION
TASK VII	CONTAMINATION CHECK & DISCONNECT

ELIMINATED

TASK VI	SIMULATED FLIGHT

CUSTOM AGENA

PRODUCTION IMPLEMENTATION

- PRODUCTION MANAGEMENT
  - PROGRAM 846 EFFECTIVITY
  - AGENA VEHICLE NO. 197
  - CONTRACT GO-AHEAD BY 1 OCTOBER 1967
  - CONFIGURATION
    - STANDARD AGENA ITEMS
    - PROGRAM PECULIAR ITEMS

[redacted]

[redacted] [redacted] [redacted]

[redacted]

[redacted] [redacted]

[redacted]

[redacted] [redacted]

1230

CUSTOM AGENA

CONFIGURATION MANAGEMENT - BACKGROUND

- DIVERGENT PROGRAM MANAGEMENT

	SAFSP	SAMSO
- SYSTEM CONCEPT	NON-OPERATIONAL	OPERATIONAL
- CONFIGURATION MANAGEMENT	INFORMAL	FORMAL
- LEVEL OF CONTRACT CONTROL	VEHICLE ONLY	VEHICLE, BLACK BOX, PCE PART & PROCESS
- DWG, COMPL. INTERPRETATION BY AIR FORCE	LIBERAL	STRICT
- SPECIFICATION PROGRAM	NEITHER AGENCY HAS TOTAL	MANAGEMENT

31

CUSTOM AGENA

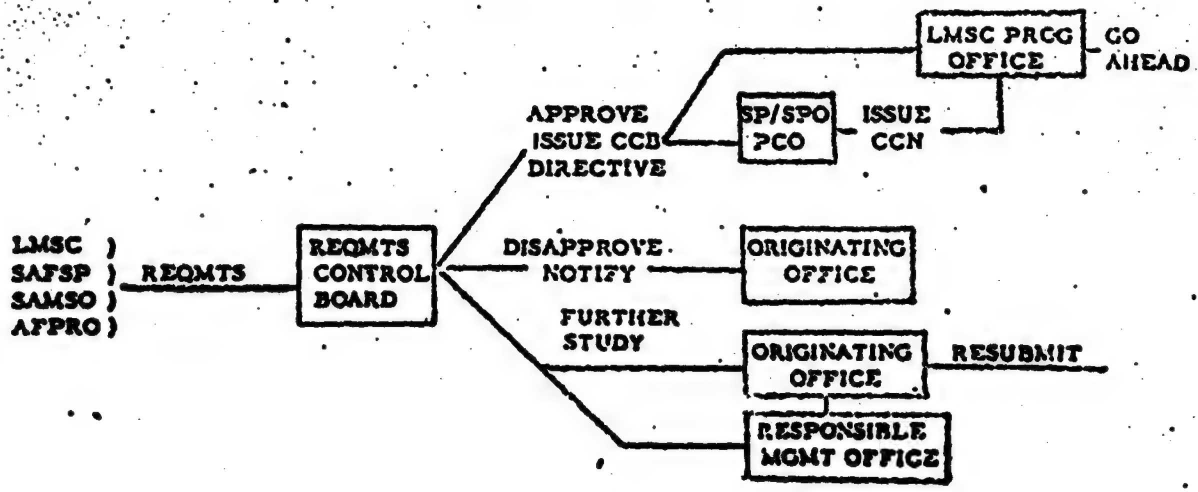
CONFIGURATION MANAGEMENT - PROPOSAL

- REALIGN CONFIGURATION MANAGEMENT REQUIREMENTS FOR SAFSP AND SAMSO
    - SPECIFICATION AND DRAWING
    - CHANGE CONTROL
    - LEVEL OF CONTROL
    - CONFIGURATION ACCOUNTING

- ESTABLISH REQUIREMENTS CONTROL BOARD
    - INSURE RESPONSIVENESS TO USER REQUIREMENTS
    - PRECLUDE DUPLICATION OF DESIGN IMPROVEMENTS
    - PERMIT STANDARDIZATION
    - CONTROL COMMON SPECIFICATION TREE
    - EFFECT COMMON MANAGEMENT OPERATING PROCEDURES

CUSTOM AGENA

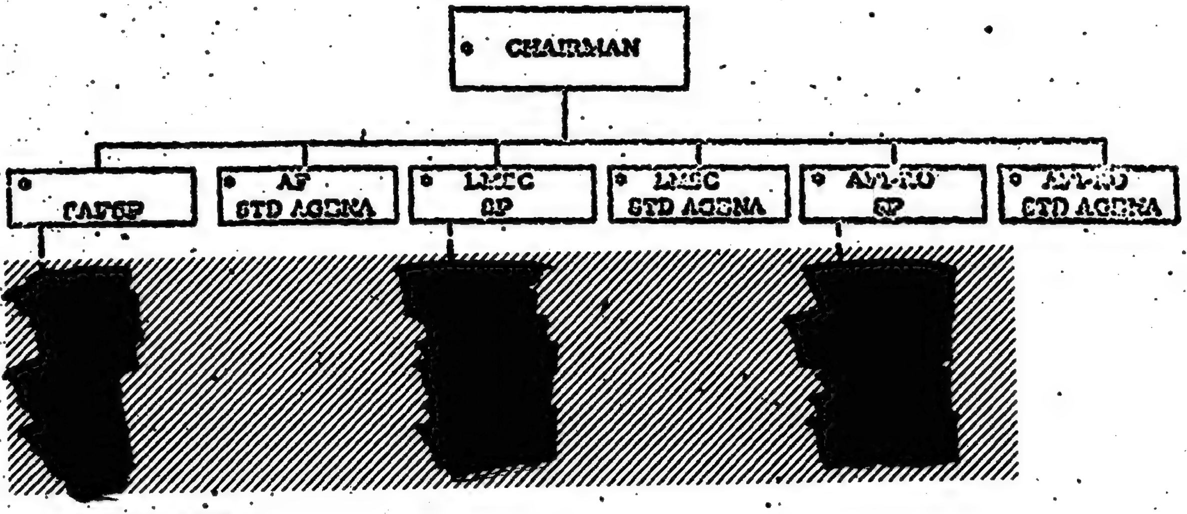
DESIGN CHANGE FLOW CHART



CUSTOM AGENA

REQUIREMENTS CONTROL BOARD

- ORGANIZATION



- CHAIRMAN
- SAFSP
- AF STD AGENA
- LMSC SP
- LMSC STD AGENA
- AFPRO SP
- AFPRO STD AGENA

[redacted]

- LOCATION
  - PERMANENT MEMBERS FULL TIME IN-PLANT AT SUNNYVALE, CALIF.

  OTHER MEMBERS AT CALL OF CHAIRMAN OR PERMANENT BOARD MEMBER

CUSTOM AGENA

SPO/SP ACTION REQUIRED TO IMPLEMENT

- DEVELOP COMMON CONFIGURATION MANAGEMENT PLAN AND REQUIREMENTS DOCUMENT FOR CONTRACT IMPLEMENTATION
- DEVELOP DETAILED OPERATING PROCEDURES AND AUTHORITY FOR REQUIREMENTS CONTROL BOARD
- FORMALLY ESTABLISH REQUIREMENTS CONTROL BOARD

PROCUREMENT IMPLEMENTATION

- CHANGE HARDWARE CONTRACTS (2)
  - -939 CONTRACT REQUIRES REVISED WORK STATEMENT BASED ON VEHICLE EFFECTIVITY
    1. NEW SPECIFICATIONS
    2. NEW TEST PROCEDURES
    3. NEW DELIVERY SCHEDULE
    4. CFE STORAGE REQUIREMENT
  - -0077 LETTER CONTRACT REQUIRES REVISED WORK STATEMENT FOR ALL VEHICLES.
  - BOTH CONTRACTS WOULD REQUIRE NEW PAYMENT SCHEDULE FOR LMSC
    1. COST SEGREGATION BY VEHICLE
    2. PARTIAL PAYMENT AFTER SPO VEHICLE VERIFICATION TEST
    3. FINAL PAYMENT AFTER FINAL SP SYSTEM TEST
  - -BOTH CONTRACTS MUST HAVE ARRANGEMENTS TO
    1. TAKE CARE OF "AFTER TRANSFER" FAILURES
    2. PERMIT FINAL PAYMENT BASED ON SP SYSTEMS TEST & JOINT SP/SPO DD-250
    3. IMPLEMENT CONFIGURATION MANAGEMENT CHANGES

CUSTOM AGENA

PROCUREMENT IMPLEMENTATION

- CHANGE STORAGE CONTRACTS
  - PRESENT CONTRACT CALLS FOR DD-250 THEN GFP STORAGE
- PLAN FOR QUICK REACTION DEVELOPMENT CONTRACT COVERAGE
  - PRESENT METHOD CAUSES USE OF THREE CONTRACTS, I. E., PROGRAM PLAN, DESIGN DEVELOPMENT, PRODUCTION CHANGE
  - IMMEDIATE PLAN WOULD USE TWO CONTRACTS, I. E., SINGLE DEVELOPMENT AND PRODUCTION
  - LONG RANGE PLAN WOULD USE ONE DEVELOPMENT & PRODUCTION CONTRACT
- ESTABLISH COORDINATION WITH SP PROCUREMENT
  - ELIMINATE PROCUREMENT DUPLICATION
  - PROMOTE BEST POSSIBLE CONTRACT MIX
  - INSURE ALL REQUIREMENTS CONTRACTUALLY COVERED

[redacted]

[redacted]

[redacted] [redacted] [redacted]

CUSTOM AGENA

CONCLUSIONS

- CUSTOM CONCEPT CAN BE IMPLEMENTED
- ELIMINATES TEARDOWN AND BUILD-UP OF VEHICLE
- IMPROVES RESPONSIVENESS TO PROGRAM REQUIREMENT AND REQUIREMENT CHANGES
- RETAINS CONSIDERATION FOR STANDARDIZATION
- PERMITS DELIVERY OF A REALISTICALLY DOCUMENTED USEABLE VEHICLE
- SHOULD DECREASE TOTAL PROCUREMENT COST

CUSTOM AGENDA

RECOMMENDATION

- ACTION BE TAKEN BY SAMSO/SAFSP TO IMPLEMENT PLAN

308

~~SECRET~~

DEPARTMENT OF THE AIR FORCE
DIRECTORATE OF SPECIAL PROJECTS (OSAF)
AF UNIT POST OFFICE, LOS ANGELES, CALIFORNIA 90045

[redacted]

1220

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~~SECRET~~

309

[illegible] 337

SMC

[illegible] III SPO and the Agena Program Office

[illegible] (Col [illegible])

1. Since June 1967, the workload of the Titan III SPO has been [illegible] to approvals being obtained [illegible] the Titan III B and C as well as the Titan III [illegible]. Also, the requirement to develop [illegible] ([illegible]) of the Agena upper stage space booster has increased the workload of the Agena Program Office. Further, recent reductions in the Aerospace Corporation [illegible] support has in turn generated a reduction in the MPS levels for both the Titan III SPO and the Agena Program Office.

2. With regard to the Titan III SPO manpower package, it is important to be cognizant of Lt Gen O'Neill's recent agreement to transfer 20 personnel and primary responsibility for the Titan III M to the MOL SPO. If Maj Gen Bleymaier is not successful in increasing his authorized strength to cover this function, the Titan SPO may be required to transfer authorizations to the extent he is unsuccessful. This would, of course, change the complexion of the current manpower package realizing that 2[illegible] additional authorizations are required rather than just the nine identified.

3. As you know, the serious deficiencies in the current manpower authorizations for the Titan III SPO are of particular concern to me. However, it should be recognized that in both organizations the workload has already developed and it is imperative that the attached manpower packages be reviewed and approved as soon as possible.

SIGNED

PAUL T. COOPER
Major General, USAF
Deputy Commander for Space

2 Atch
1. Mpr Pkg Titan III
2. Mpr Pkg Agena Prog

-292-04 ~~SECRET~~

SMG

~~SMV~~ 310

[illegible] RUEDTAA7326 2912[illegible]

ZNY [illegible]

P 182134Z OCT 67

FM AFSC

TO SAMSO LOS ANGELES CALIF

BT

1967 OCT 19 AM 7:13
08z

~~SECRET~~ SCSSM 36845 OCT 67

1. SMG, SMV. IN ACCORDANCE WITH SAFRD, 18 OCT 67, DECISION TO TRANSFER ALL AGENA ACTIVITIES AT SAMSO TO SAFSP, YOU ARE TO PROCEED WITH IMPLEMENTATION AS FOLLOWS: (A) THE SAMSO AGENA SPO IS TO BE TRANSFERRED FROM SAMSO TO SAFSP INTACT AT A DATE MUTUALLY AGREEABLE TO THE COMMANDER, SAMSO, AND THE DIRECTOR, SAFSP, BUT NO LATER THAN OCTOBER 25,1967. AS IS THE CASE WITH MOST SAFSP PERSONNEL, THE MANPOWER SPACES OF THE AGENA SPO WILL REMAIN ASSIGNED TO SAMSO BUT THE INCUMBENT PERSONNEL WILL BE DETAILED TO FULL TIME DUTY WITH SAFSP. ALL SAMSO CONTRACTS MANAGED BY THE AGENA SPO WILL BE TRANSFERRED WITH THE SPO TO SAFSP TO BE MANAGED THEREAFTER IN THE SAFSP-OSAF MANAGEMENT CHANNELS AND PROCEDURES, (B) FOR YOUR INFORMATION ANDTO

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DOD DIR 5200.10

~~PAGE 2 RUEDTAA7326 SECRET~~

ASSIST YOU IN COORDINATING IMPLEMENTATION ACTIONS, THE DIRECTOR, SAFSP WILL CONTACT THE COMMANDER, SAMSO, TO EFFECT APPROPRIATE ARRANGEMENTS FOR THE TRANSFER OF RESPONSIBILITY AND TO TAKE ADDITIONAL ACTIONS AS FOLLOW: (1) TO PROCEED IN AN ORDERLY MANNER TO CHANGE THE AGENA PROCUREMENT AND PRODUCTION CONCEPTS TO THOSE OUTLINED IN SAFSP LETTERS OF MAY 25,1967 AND SEPTEMBER 15,1967, (2) TO CHANGE THE PROCUREMENT OF AGENA LAUNCH SERVICES, BTL GUIDANCE, AND RELATED SUPPORT WHICH ARE NOW PROCURED BY THE AGENA SPO TO A CONCEPT WHEREBY SAFSP PROCURES THESE SERVICES, EQUIPMENT AND SUPPORT FOR SAFSP USE, AND ASSISTS NASA OR OTHER USERS TO PROCURE EITHER DIRECTLY OR THROUGH SAFSP THE AGENA VEHICLES AND THE LAUNCH SERVICES, EQUIPMENT AND SUPPORT WHICH THE OTHER USERS REQUIRE.(3) TO ASSUME RESPONSIBILITY IN SAFSP FOR THE DEVELOPMENT OF THE IMPROVED AGENA WITH THE 8533 ENGINE AND ISPS AS OF THE DATE OF TRANSFER OF THE AGENA SPO. REVIEWS OF THIS PROJECT

292-04

PAGE 3 RUEDTAA 7326 ~~SECRET~~

CURRENTLY SCHEDULED IN THE SAMSO-AFSC-HQ USAF CHANNEL ARE BEING CANCELLED AND WILL BE REPLACED BY A SUITABEL REVIEW SCHEDULE IN THE SAFSP-OSAF CHANNEL. (4) TO PLAN AND IMPLEMENT A REDUCTIONIN [illegible] 75 MANPOWER SPACES CURRENTLY AUTHORIZED IN THE AGENA SPO BY JUNE 30, 1968. EXCESS SPACES ARE TO BE RETURNED TO AFSC AND EXCESS PERSONNEL AR TO BE RELEASED FROM DETAIL TO SAFSP AND FROM THE SAFSP [illegible] CONTROL LIST. (5) TO FURNISH WITHOUT

No Action
James L. Hook Lt.
SDO

~~SECRET~~

1223

DELAY DETAILS OF FUNDING REVISIONS REQUIRED OR PERMITTED BY THE ABOVE ACTIONS TO [redacted] ADDITIONAL GUIDANCE WILL BE PROVIDED IN THE IMMEDIATE FUTURE. GP-4
BT

~~SECRET~~

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DOD DIR 5200.10

[illegible] (Lt Col Crawford) [illegible]

Agena D Flight Summary

SP-15B (Lt Col Wheeler)

1. Attached for your retention is a summary of all Agena D flights from 1962 through the present date. This summary is a condensation of the more complete data provided by LMSC in the "Agena Flight Summary Report" submitted semiannually. I recommend tha[redacted] maintain the summary on a current basis. In the past, Col Hamilton has been a recipient of our summary and it may be that he is still interested in getting a copy.

2. For the purpose of this summary, the following definitions and explanations apply.

a. The first column shows the cumulative totals of Agena D flights, successes, failures, no trials and percentage of successes. Success is defined as meeting primary mission objectives in Agena ascent and orbit injection. No trial is defined as a first stage booster anomaly which prevents normal Agena performance. Percentage of success is determined by the equation

$$\frac{\text{Successes}}{\text{Total flights-no trials}} \times 100$$

b. The second column shows the cumulative total of all Agena Flights. There were 93 flights of Agena A's and Agena B's. Since these vehicles have now all been flown, the total Agena flights will remain at 93 greater than the Agena D total. The summary includes a breakout of these flights for information.

c. The third column states the Agena D (AD) sequence number and the contract on which it was produced. It should be noted that in the transition from SS-01A to SS-01B, AD numbers 61-1, 61-2, 61-3, 61-4, 61-5 and 61-6 were assigned to the last SS-01A's. All vehicles from AD-62 are SS-01B's. Thus there will be 6 more vehicles produced than indicated by the AD numbers.

d. The fourth column lists the program which flew the Agena and the vehicle designator assigned by that program.

e. The remarks column states reasons for failures and no trial and also indicates major equipment problems, even though the flight is judged a success. It also includes comments on orbital performance.

3. This letter, with attachment removed, is unclassified. The

attachment is classified SECRET, GP 3, because it reveals launch dates by program, success ratio by program and overall Agena performance capabilities.

ROBERT R. CRAWFORD, Lt Col, USAF
Chief, [redacted]

1 Atch
Agena Flight Summary Report (S) (2 cy)

cy to: [redacted] w/atch (S)

AGENA D FLIGHT SUMMARY

2 JAN

	AGENA D FLIGHTS				AGENA	AD		LAUNCH	
NR	S	F	NT	%	FLT NO	NO/CONT	PROGRAM/VEH	DATE	REMARKS
1	1			100	64	1/21	162/1151	27 Jun 62	VM error
2	2				69	2/21	162/1152	1 Aug 62	
3	3				72	3/21	162/1153	28 Aug 62	H/S fail orbit 45
4	4				76	4/21	162/1154	29 Sep 62	Temp DC power loss
5	5				79	8/21	162/1401	26 Oct 62	
6	6				83	5/21	162/1155	4 Dec 62	
7	7				84	10/21	698/2351	12 Dec 62	VM & Seq Timer problem
8	8				85	6/21	162/1156	14 Dec 62	
9	9				87	7/21	162/1157	7 Jan 63	H/S fail - re-entry error
10			1	100	89	9/21	162/1159	28 Feb 63	Booster fail (LV-2A)
11		1		90	90	20/68	162/1164	18 Mar 63	Premature eng shut-down Short in AFT S/A J-Box
12	10			91	91	12/21	162/1160	1 Apr 63	Power Amp. fail. early recovery
13		2		83	92	17/68	162/1411	26 Apr 63	Human error in H/S setting
14	11			85	94	18/68	162/1165	18 May 63	
15	12			86	96	21/68	162/1161	12 Jun 63	

~~SECRET~~

DECLASSIFIED [illegible]

[redacted]

~~Secret~~

[redacted]

1001

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[redacted]

[redacted]

[illegible] 12 YEAR
[illegible] AUTOMATICALLY
[illegible] 5200.10

SP-1997

G #2

~~SECRET~~

SUMMARY OF DATA AS OF 23 JAN 67

1. **Agena D Flights**

Agena D Successes	148
Agena D Failures	10
Agena D No Trials	6
Total Agena D Flights	164

2. In addition to Agena D there have been 93 flights of Agena A and Agena B with the following results:

Agena A Successes	12	Agena B Successes	59
Agena A Failures	5	Agena B Failures	8
Agena A No Trials	2	Agena B No Trials	7
Total Agena A Flights	19	Total Agena B Flights	74

3. Agena D Reliability by Production Contract

Contract	Nr Produced	AD Nrs	Launched	S	F	NT	%
-21	12	1-12	12	10	1	1	90.0
-68	39	13-51	39	34	3	2	91.9
-194	46	52-91	45	40	4	1	90.9
-451	29	98-120	28	25	2	1	92.6
-722	57	121-177	40	39	0	1	100
-939	36	178-213	0				
TOTAL	219		164	148	10	6	93.7

~~SECRET~~

4. Agena D Reliability by year

Year	Launches	S	F	NT	%
1962	8	8	0	0	100
1963	23	18	3	2	85.7
1964	35	32	3	0	91.4
1965	29	26	1	2	96.3
1966	39	36	2	1	94.7
1967	28	26	1	1	96.3
1968	2	2	0	0	100
TOTALS	164	148	10	6	93.7

~~SECRET~~

DEPARTMENT OF THE AIR FORCE
DIRECTORATE OF SPECIAL PROJECTS (OSAF)
AF UNIT POST OFFICE, LOS ANGELES, CALIFORNIA 90045

REPLY TO
ATTN OF: [redacted]

15 April 1968

312

SUBJECT: Final Agena Historical Report, 1 July - 19 October 1967

TO: SME

1. On 19 October 1967 the Agena Program Office, SMVA, was reassigned from the Space and Missile Systems Organization (AFSC) to the Office of the Secretary of the Air Force, Directorate of Special Projects. Several factors influenced the final decision which led to this organizational change but the following was primary:

a. The original requirement for a "Standard" Agena vehicle came about as a result of the need for the vehicle by many diverse programs - both Air Force and NASA. Central procurement and support engineering by a Standard Agena office was determined to be the most economical method of meeting each program's needs. Each using program, upon receipt of their "Standard" Agena D, added program peculiar equipment and modified the vehicle as required.

b. A review of known, firm using program requirements during first quarter FY 69 indicated an almost exclusive use of the Agena D by SAFSP; therefore the original justification for a "standard" vehicle (i.e., the diverse requirement by many programs) was no longer valid.

2. At the time of the reorganization, 67 people were assigned to SMVA and Colonel Norman J. Keefer was Agena System Program Director. The organization was made up of five divisions - Engineering with 19 officers and 4 civilians, Configuration Management with 5 officers and 3 civilians, Program Control with 3 officers and 4 civilians, Operations with 9 officers and 2 civilians, and Procurement with 1 officer and 13 civilians.

[redacted]

JEAN G. GOPPERT, Colonel, USAF
Deputy Director for Agena

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1257

AGENA VEHICLE

Cont. No.	Contractor	Type	Description	Period Of Perf.	[redacted]
AF-21 (3-125)	LMSC	CPIF	Agena D Vehicles	8/61-9/62	[redacted]
AF-63	"	FPIF	Agena D Vehicles	9/62-8/63	[redacted]
AF-191	"	CPFF	Agena Support & Services		[redacted]
AF-194	"	FPIF	Agena S-01A Vehicles	7/63-10/64	[redacted]
AF-221	"	FFP	Repair, Maintenance & Eng.	10/62-7/65	[redacted]
AF-254	"	FFP	Utility Tech Manuals	*Comp. 12/63	[redacted]
AF-265	"	CPIF	Santa Cruz Test Base	10/63-6/65	[redacted]
AF-376	"	FFP	S-01A Vehicle Storage	*Comp. 3/64	[redacted]
AF-451	"	FPIF	Agena S-01B Vehicles	1/64-12/64	[redacted]
AF-539	"	CPIF	Basic Ordering Agreement	4/65-Annual	[redacted]
Order #1	"	"	PREP Round #V	4/65-1/66	[redacted]
Order #2	"	"	TYPE XIV Battery	5/65-1/66	[redacted]
Order #3	"	"	TYPE IX Dc/Dc Converter	5/65-12/65	[redacted]
Order #5	"	"	Sequence Timer Mod.	8/65-1/67	[redacted]
Order #7	"	"	PREP Round #VI	8/65-6/66	[redacted]
Order #8	"	"	Zipcord Development	11/65-12/66	[redacted]
Order #9	"	"	S-01 Logistics Support	11/65-10/66	[redacted]
Order #10	"	"	Gas Ingestion Test Program	12/65-8/66	[redacted]
Order #11	"	"	Main Electrical Umbilical Redesign	2/66-6/67	[redacted]
Order #12	"	"	PREP Round #VII	1/66-12/66	[redacted]
Order #13	"	"	THORAD Test Support	11/65-7/66	[redacted]
Order #15	"	"	TYPE IIH Battery Cell Test	1/66-9/66	[redacted]

* Contract Complete - has been sent to records storage

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1260

AGENA VEHICLE

Contr No.	Contractor	Type	Description	Period Of Perf.	[redacted]
Order #16	LMSC	CPIF	Electronic Event Timer	10/66-4/68	[redacted]
Order #17	"	"	Brazed Plumbing	6/66-2/67	[redacted]
Order #19	"	"	Logistics Support & Repair	11/66-11/67	[redacted]
AF-596	"	FFP	S-01 Vehicle Storage	*Comp. 6/65	[redacted]
AF-668	"	FFP	Titan III X/Agena Study	*Comp. 10/64	[redacted]
AF-695	"	FFP	Agena Support & Services	1/65-12/66	[redacted]
AF-722	"	FPIF	Agena Vehicle Prod	2/65-1/67	[redacted]
AF-732	MIT	CR	Guidance & Control Study	1/65-12/65	[redacted]
AF-761	LMSC	CPIF	Santa Cruz Test Base	7/65-6/67	[redacted]
AF-766	Bell	FFP	Agena Engine Prod.	2/65-10/66	[redacted]
					[redacted]
AF-815	"	FFP	Agena Vehicle Storage	*7/65-6/66	[redacted]
AF-918	Quantic Inc.	FFP	Studies - Infra Red Detector	12/65-12/66	[redacted]
AF-924	Bolock Instr.	FFP	IR Horizon Sensor Model	1/66-1/67	[redacted]
AF-950	Bell	FP	Basic Ordering Agreement	3/66-Annual	
Order #2	"	"	Repair of 8096 Engine	6/66-9/67	[redacted]
AF-938	"	FFP	Agena Engine Prod.	1/66-11/67	[redacted]
AF-939	LMSC	FPI	Agena Vehicle Prod.	1/66-4/68	[redacted]
AF-947	MIT	CR	Guidance & Control Study	1/66-12/66	[redacted]
AF-1008	Barnes Eng	FFP	Horizon Sensor Prod.	5/66-11/67	[redacted]
AF-1044	Bell	FFP	Velocity Meter Prod.	6/66-4/68	[redacted]
AF-1068	LMSC	FFP	Agena Vehicle Storage	7/66-6/67	[redacted]

* Contract Complete - has been sent to records storage

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[redacted]

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[redacted] [redacted]

[redacted] [redacted]

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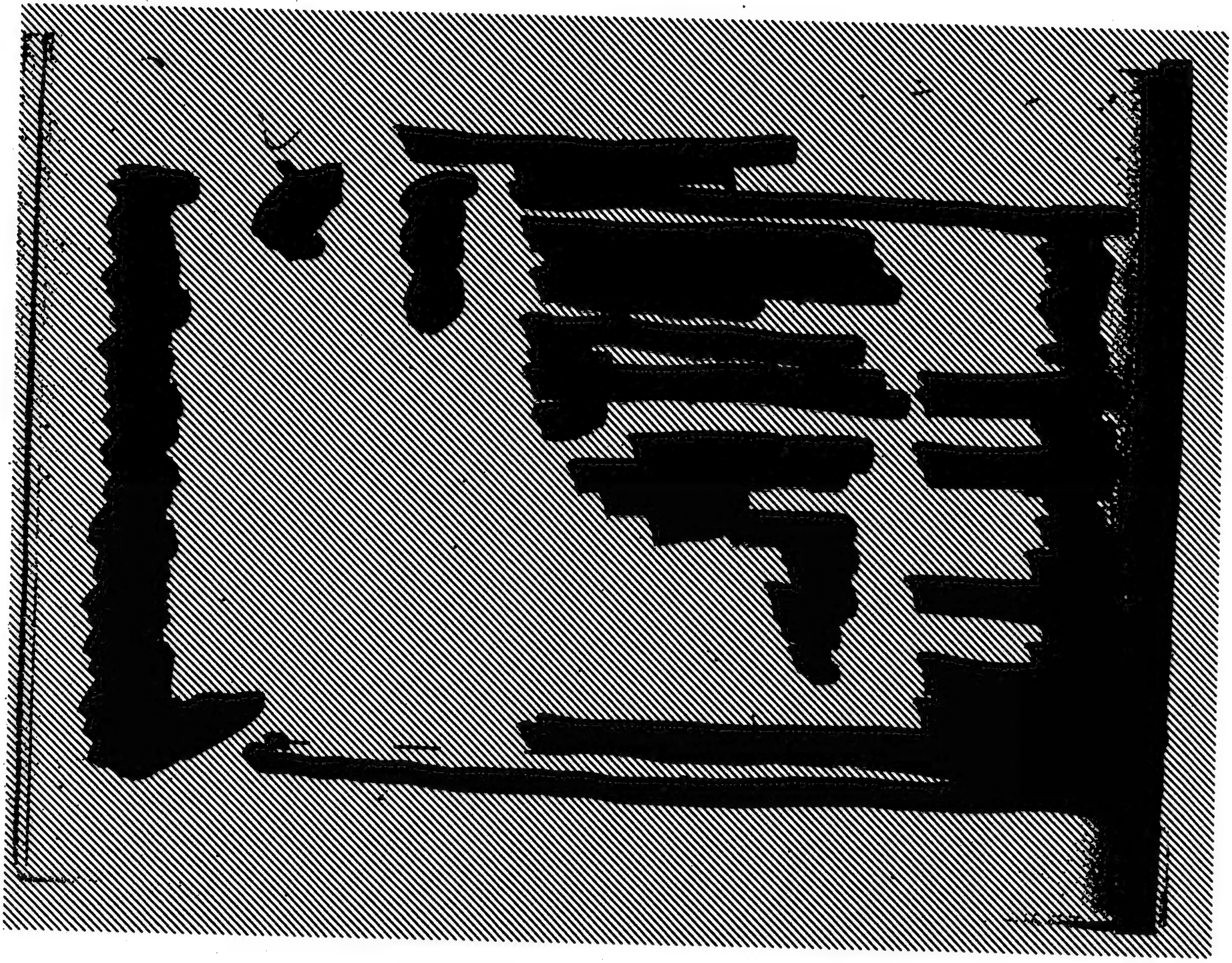
DOWNGRADED AT 3 YEAR INTERVALS.
DECLASSIFIED AFTER 12 YEARS.
DOD DIR 5200.10



1263

AGENA LAUNCH SERVICES & SUPPORT

Contr No.	Contractor	Type	Description	Period Of Perf.	[redacted]
AF-52	LMSC	CPFF	PMR Launch Support	1/62-12/62	[redacted]
AF-62	"	CPFF	Advent Program	3/62-11/62	[redacted]
AF-79	"	CPFF	Agena-D Peculiar Mods	*Comp. 7/64	[redacted]
AF-131	"	CPFF	Pt Arguello Launch Com. 2	4/62-1/63	[redacted]
AF-135	"	CPFF	AMR Launch Pad 13	5/62-4/63	[redacted]
AF-193	"	FFP	AGE Study	*Comp. 11/62	[redacted]
AF-198	"	CPIF	AMR Launch Support	10/62-12/63	[redacted]
AF-233	"	CPIF	PMR Launch Support	12/62-12/63	[redacted]
AF-239	"	FFP	AMR Pad 14 Study	*Comp. 1/63	[redacted]
AF-287	"	CPIF	AMR Pad 14 Conversion	2/63-12/64	[redacted]
AF-317	"	FFP	AGE Launch Disaster Pool	*Comp. 5/64	[redacted]
AF-479	"	CPIF	AMR Launch Support	1/64-12/64	[redacted]
AF-501	"	CPIF	PMR Launch Support	1/64-12/64	[redacted]
AF-628	"	CPIF	ETR Launch Support	1/65-12/65	[redacted]
AF-689	"	CPIF	WTR Launch Support	1/65-12/65	[redacted]
AF-715	"	CPIF	AGE Improvements & Mod	12/64-7/65	[redacted]
AF-821	"	CPIF	Agena Age Power Supply	5/65-7/66	[redacted]
AF-936	"	FPIF	ETR Launch Support	1/66-3/67	[redacted]
AF-968	"	FPI	WTR Launch Support	4/66-9/67	[redacted]

* Contract Complete - has been sent to records storage.

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

*Obligated funds equal funds received on these contracts

[illegible]

[redacted]

[redacted]

[redacted]

[redacted]

AGENA PROGRAM

DOCUMENTATION - AUTHORITY - SIGNIFICANT CHANGES

[illegible]

PROGRAM [illegible] ABBREVIATED PROGRAM PLAN, DECEMBER 1961

PROGRAM [illegible] AMENDED PACKAGE, APRIL 1962

AGENA D PROGRAM MANAGEMENT CONCEPT, AFSC, 30 MARCH 1965

PCS [illegible] - [illegible] - C35, PROGRAMMING AND FUNDING FOR SPACE LAUNCH VEHICLES [illegible] MARCH 1965 - DECEMBER 1966

AGENA D, ADVANCED DEVELOPMENT PLAN, JUNE 1966, [illegible] CHEMICAL ROCKET, SPACE MANEUVERING ([illegible]/[illegible] ENGINE & [illegible])

[illegible]

30 NOV 61 - HQ USAF MESSAGE (AFSDC-P-82530) AUTHORIZING 12 R&D VEHICLES PROCUREMENT PACKAGE, PRODUCTION CAPABILITY 2 VEH/MO.

5 JUL 62 - HQ USAF MESSAGE (AFSSV-[illegible]-90915) AUTHORIZING 39 PRODUCTION VEHICLES AT A 4 VEH/MO. RATE.

18 JUL 62 - HQ USAF MESSAGE ([illegible]-66176) AUTHORIZING 22 ADDITIONAL PRODUCTION VEHICLES AT 4 VEH/MO.

[illegible] OCT 62 - HQ USAF MESSAGE (AF[illegible]-11-62-117) AUTHORIZING ADDITIONAL [illegible] PRODUCTION VEHICLES AT [illegible] VEH/MO.

2 JAN 63 - HQ AFSC MESSAGE ([illegible]-9-1-12) CHANGING THE PRODUCTION RATE TO 3 VEH/MO EFFECTIVE 18 JUL 63.

21 DEC 63 - HQ USAF MESSAGE (AFRDC 80266) AUTHORIZING 29 PRODUCTION VEHICLES AT A 3 VEH/MO RATE

22 APR 64 - HQ USAF MESSAGE (AFRDD 71625) AUTHORIZING 22 PRODUCTION VEHICLES AT A 3 VEH/MO RATE

10 DEC 64 - HQ USAF MESSAGE (AFRPA 96778) AUTHORIZING 35 PRODUCTION VEHICLES AT A 3 VEH/MO RATE

1 NOV 65 - DDR&E MEMO AUTHORIZING 36 PRODUCTION VEHICLES AT A 2½ VEH/MO RATE

4 NOV 66 - HQ USAF MESSAGE (AFRPA 84122) AUTHORIZING 25 PRODUCTION VEHICLES AT A 2 VEH/MO RATE

1269.

AUTHORITY CONT'D:

PRODUCTION SUMMARY:

CONTRACT	QUANTITY	DELIVERIES
AF04(695)-21	12	APR 62 - SEPT 62
AF04(695)-68	39	SEP 62 - JULY 63
AF04(695)-194	46	JULY 63 - DEC 64
AF04(695)-451	29	JAN 65 - DEC 65
AF04(695)-722	57	DEC 65 - JAN 67
AF04(695)-939	36	FEB 67 - APR 68
AF04(695)-67-C-0077	25	APR 68 - APR 69
	244	

1270.

[illegible]

NOV 62	FACI COMPLETED FOR S-01A AGENA D NO. 39.
MAR 63	INITIATION OF PRODUCTION TEST PROGRAM ([illegible])
MAY 63 - APR 64	DEVELOPMENT AND INCORPORATION OF 8247 MULTI START ENGINE, AGENA D NO. 71
JAN 64	INCORPORATION OF ADDITIONAL BASIC CAPABILITIES (ABC PROGRAM) IN PRODUCTION VEHICLE - AGENA D NO. 62
MAR 64	FACI COMPLETED FOR S-01B AGENA D NO. 68
MAR 65	DIRECT BUY OF 8096 ENGINES FROM BELL AEROSYSTEMS AF04(695)-766
FEB 66	DIRECT BUY OF HORIZON SENSORS FROM BARNES ENGINEERING AF04(695)-1008.
MAR 66	DIRECT BUY OF VELOCITY METERS FROM BELL AEROSYSTEMS AF04(695)-1044

AGENA CONTRACT STRUCTURE

JUNE 1956 - LOCKHEED NOTIFIED THEY WON COMPETITION FOR WS-117L

CONTRACTOR	CONTRACT NO.	AMT.	PERIOD OF PERFORMANCE	END ITEM	HOW AWARDED
LMSD	AF04(647)-97		OCT 1956 - DEC 1957		COMPETITION
LMSD	AF04(647)-181		DEC 1957 - JUN 1959		FOLLOW-ON
LMSD	AF04(647)-347		MAR 1959 - BREAKOUT TO USING PROGRAMS		SOLE-SOURCE
LMSC	AF04(695)-21	[redacted]	AUG 1961 - NOV 1962	DESIGN QUALIFICATION & PRODUCTION OF (12) AGENA VEHICLES, S-01A	SOLE SOURCE LMSC
LMSC	AF04(695)-68	[redacted]	DEC 1961 - AUG 1963	PRODUCTION OF 36 AGENA S-01 VEHICLES SPARES AND OPTIONALS	SOLE SOURCE LMSC
LMSC	AF04(695)-194	[redacted]	AUG 1962 - OCT 1964	PRODUCTION OF 46 AGENA VEHICLES, SPARES & OPTIONALS, INCORP CHANGE FROM S-01A TO S-01B	SOLE SOURCE LMSC
LMSC	AF04(695)-451	[redacted]	DEC 1963 - DEC 1964	PRODUCTION OF 29 AGENA VEHICLES, SPARES AND OPTIONALS	SOLE SOURCE LMSC

AGENA CONTRACT STRUCTURE (Cont'd)

JUNE 1956 - LOCKHEED NOTIFIED THEY WON COMPETITION FOR WS-117L

CONTRACTOR	CONTRACT NO.	AMT.	PERIOD OF PERFORMANCE	END ITEM	HOW AWARDED
LMSC	AF04(695)-722	[redacted]	FEB 1965 - JAN 1967	PRODUCTION OF 57 AGENA VEHICLES, SPARES & OPTIONAL (LESS BELL ENGINES)	SOLE SOURCE LMSC
BELL AEROSYSTEMS	AF04(695)-766	[redacted]	FEB 1965 - OCT 1966	PRODUCTION OF 55, 8096 AND 2, 8247 ENGINES	SOLE SOURCE BELL
LMSC	AF04(695)-939	[redacted]	JAN 1966 - NOV 1968	PRODUCTION OF (36) S-01B AGENA VEHICLES, SPARES AND OPTIONALS	SOLE SOURCE LMSC
BELL AEROSYSTEMS	AF04(695)-938	[redacted]	JAN 1966 - NOV 1967	PRODUCTION OF (36), 8096 ENGINES	SOLE SOURCE BELL
LMSC	F04695-67-C-0077	[redacted]	JAN 1967 - DEC 1969	PRODUCTION OF (19), AGENA S-01B VEHICLES, SPARES & OPTIONALS	SOLE SOURCE LMSC
LMSC	F04695-67-C-0128	[redacted]	FEB 1967 - JULY 1967	PHASE I STUDY APPROVED AGENA PROGRAM	SOLE SOURCE LMSC

AGENA-3

PROJECT COUGH DROP

- IMMEDIATE RETROFIT
  - REPLACE BEARINGS WITH LOOSE CLEARING BEARINGS
  - REPLACE FUEL SECONDARY BEARING
  - INSPECT GEARS - REPLACE ALL INVINCIBLES WITH RILEY
  - PERFORM REVERSE LEAK CHECK ON FUEL SECONDARY SEAL
  - REDUCE LEAK SPEC ON TURBINE HOT GAS SEAL
- RETROFIT PLAN EXCLUDES 13 VEHICLES
  - SYSTEM TEST COMPLETE
  - SCHEDULE IMPACT
- 10 VEHICLES CAN BE RETROFITTED BETWEEN 15 JULY AND 1 NOVEMBER 1967
- NO IMPACT ON FLIGHT SCHEDULES - MINOR IMPACT ON USER PRODUCTION SCHEDULES
- ESTIMATED COST: 20 - 30K/VEHICLE

AGENA

PROJECT COUGH DROP

- NOVEMBER RETROFIT - FOLLOWING PHASE II TEST VALIDATION
  - "YORK QUALITY" GEARS
  - NEW HIGH TEMPERATURE BEARINGS
  - IMPROVED TURBINE DRIVE AND FUEL SECONDARY SEALS
  - POSSIBLE CHANGES TO LUBRICATION - QUANTITY AND QUALITY

- RETROFIT OF 17 ADDITIONAL VEHICLES BETWEEN 1 NOV 67 AND 1 MAR 68

- NO IMPACT ON FLIGHT SCHEDULES

- ESTIMATED COST: 25/35K PER VEHICLE

CONCLUSION

- INCREASED CONFIDENCE IN P_C DIP ELIMINATION JUSTIFIES $20-30K/ENGINE EXPENDITURE FOR IMMEDIATE RETROFIT OF 10 ADDITIONAL ENGINES

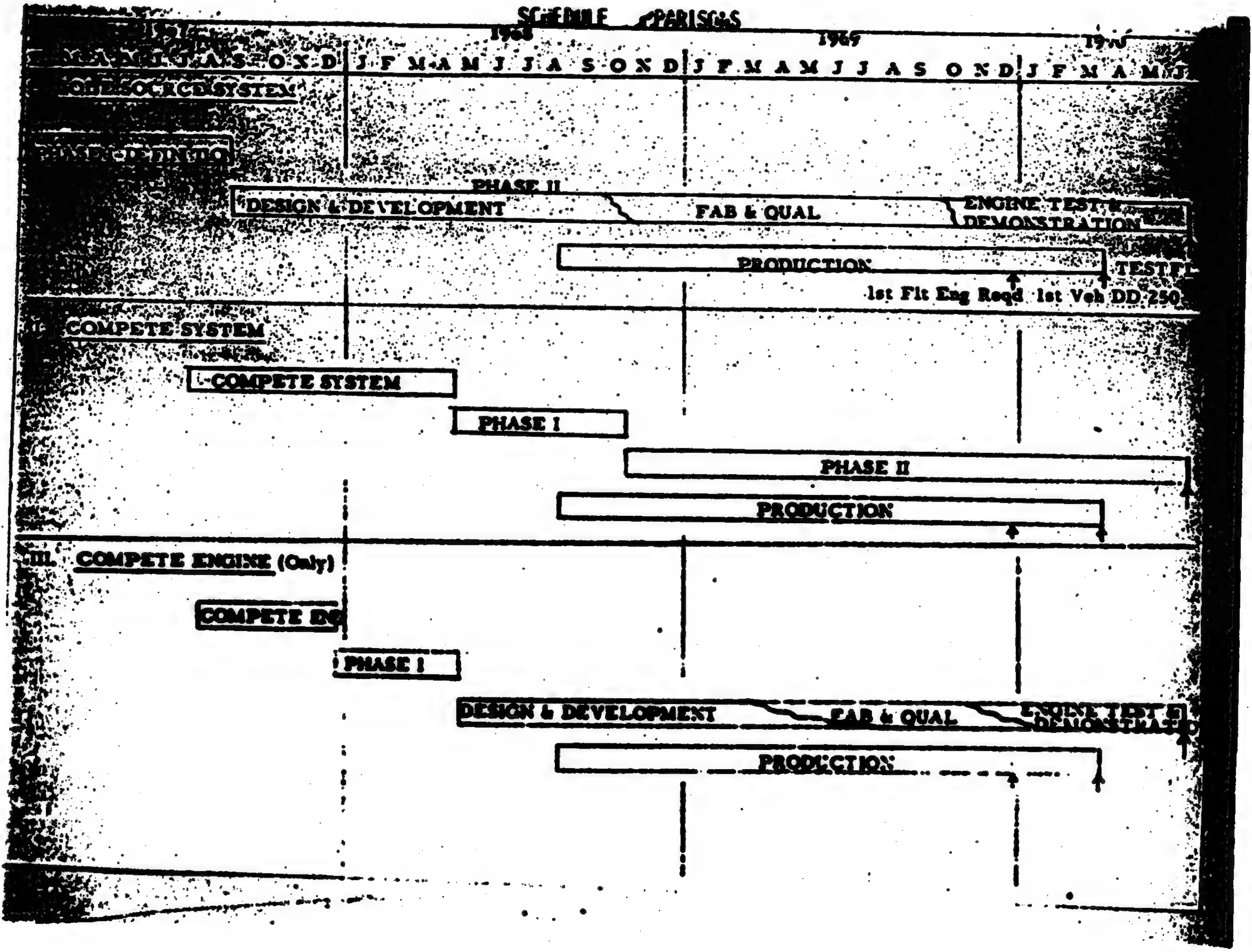
RECOMMENDATION

- APPROVAL OF IMPLEMENTATION OF IMMEDIATE RETROFIT PLAN

SOLE SOURCE CONSIDERATIONS

- FEBRUARY 1967 (SYSTEM)
  - "MAXIMUM USE OF STANDARD AGENA COMPONENTS"
  - EXISTING FACILITIES
  - AGENA KNOW-HOW (LMSC/BAC)
  - SCHEDULE, MARCH 69 DD 250
- JULY 1967 (SYSTEM)
  - PHASE I DEFINITION ORIENTATED TOWARDS MAXIMUM USE OF STANDARD AGENA COMPONENTS
  - SPECIFICATIONS AND OTHER DATA FOR PHASE II NOT USEFUL FOR COMPETITION
  - ALL PHASE I ARGUMENTS STILL APPLY EXCEPT DD 250 MARCH 70
  - AWARD TO NEW CONTRACTORS WOULD REQUIRE NEW PHASE I
  - SP RELATIONSHIPS
- JULY 1967 (ENGINE ONLY)
  - PHASE I SYSTEM DEFINITION ORIENTED TOWARDS IMPROVEMENT OF EXISTING ENGINE
  - SPECIFICATIONS AND OTHER DATA FOR PHASE II NOT USEFUL FOR COMPETITION
  - ALL PHASE I ARGUMENTS STILL APPLY EXCEPT DD 250 MARCH 70
  - AWARD TO NEW CONTRACTOR WOULD REQUIRE NEW PHASE I FOR SYSTEM

SCHEDULE COMPARISONS



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AGENA E

CONCLUSIONS

- STILL ON FIRM GROUND FOR SOLE SOURCE
  - SYSTEM
  - ENGINE ALONE

RECOMMENDATION

- CONTINUE SOLE SOURCE TO LMSC/BAC

AGENA

SP CONCEPT

- CONFIGURATION WILL BE DETERMINED BY ACTION TAKEN ON AGENA D MANAGEMENT
  - SP WILL DETERMINE PROJECT PECULIAR ITEMS OR PROCESSES
  - PROJECT PECULIARIZATION WILL CONTINUE
  - DOES NOT CONTEMPLATE A STANDARD VEHICLE
- AGENA SPO RESPONSIBLE FOR
  - DEVELOPMENT "IN A STANDARD FORM"
  - PROVIDING "STANDARD AGENA" TO SP FOR FLIGHT TEST
- TEST PROGRAM TO BE CONDUCTED BY SP
  - SYSTEM ENGINEERING
  - INTEGRATION OF SCIENTIFIC PAYLOAD
  - TEST PLAN
  - FLIGHT TEST

AGENA

SPO CONCEPT

- INITIAL CONFIGURATION DETERMINED BY:
  - DIRECTED LIMITATIONS
  - SP MISSION PERFORMANCE REQUIREMENTS

- PROCEED INTO PHASE II WITH INITIAL CONFIGURATION DESIGN REQUIREMENTS BASELINE

- DEFINE ADDITIONAL HOUSEKEEPING SUBSYSTEMS ASAP:
  - SPACEFRAME
  - POWER
  - GUIDANCE & CONTROL
  - TT & C
  - AGE

) MODULARIZED TO SUIT MISSION REQUIREMENTS

- OBTAIN APPROVAL FOR COMPLETE SYSTEM CONFIGURATION DEVELOPMENT FROM SAMSO, SAFSP, AFSC, USAF, SAFRD

- SPO CONDUCT TEST PROGRAM AS PART OF DEVELOPMENT EFFORT

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AGENA E

CONCLUSIONS

THERE IS A FUNDAMENTAL PHILOSOPHICAL DIFFERENCE BETWEEN SP AND AGENA SPO ON IMPROVED AGENA DEVELOPMENT

- **SP VISUALIZES:**
  - HOUSEKEEPING SUBSYSTEMS AS PECULIAR UNDER DIRECT SP CONTROL
  - TEST PROGRAM TO BE CONDUCTED BY SP

- **SPO VISUALIZES:**
  - HOUSEKEEPING SUBSYSTEMS AS STANDARD (MODULARIZED) AS PART OF SPACECRAFT SYSTEM
  - TEST PROGRAM TO BE PART OF SPO DEVELOPMENT PROGRAM

RECOMMENDATIONS

- ADVOCATE THE SPO CONCEPT OF SYSTEM DEVELOPMENT
- REPLY TO GENERAL MARTIN'S 23 JUNE LETTER EXPRESSING SAMSO CONCEPT OF IMPROVED AGENA DEVELOPMENT

RECOMMENDATIONS

SUMMARY

- **AGENA D**
  - I ADVOCATE THE CUSTOM SYSTEM CONCEPT AND ADVISE AFSC AND SAFSP
  - II APPROVE IN PRINCIPLE RETURNING TO PRIME CONTRACT STRUCTURE
  - III APPROVE TURBO PUMP IMMEDIATE RETROFIT PROGRAM
- **AGENA E**
  - IV APPROVE CONTINUING SOLE SOURCE ON PHASE II
  - V ADVOCATE THE SPO CONCEPT OF DEVELOPMENT AND ADVISE SAFSP

CONFIDENTIAL

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS SPACE AND MISSILE SYSTEMS ORGANIZATION (AFSC)
AIR FORCE UNIT POST OFFICE, LOS ANGELES, CALIFORNIA 90045

REPLY TO ATTN OF: [illegible]

27 July 1967

299

SUBJECT: Historical Report

TO: SMV

Attached is one copy of SSVA Historical Report for the period of 1 Jan 67 to 30 June 67.

Lt Col, USAF
Acting Program Director, AGENA

1 Atch
Historical Report, w Satch

5 (c)
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When [illegible] are withdrawn this
[illegible] correspondence
will be [illegible] Uncl
in [illegible]

CONFIDENTIAL

AGENA PROGRAM OFFICE

Historical Data

1 Jan 67 to 30 Jun 67

1. Col Norman J. Keefer assumed the duties of Chief, Agena Program Office on 8 May 1967, thus relieving Col Alfred J. Gardner who has assumed the duties of Special Assistant to the Deputy for Launch Vehicles until his retirement on 31 July 1967.

2. During January the remaining two vehicles of the 57 vehicle production contract, AF04(695)-722, were delivered. The first ten vehicles of the current 36 vehicle production contract, AF04(695)-939 were delivered at the rate of two a month commencing in February. The original production rate on the current contract was scheduled at 2½ vehicles per month commencing in February 1967 and terminating in April 1968. Due to a change in using program requirements, resulting in an increasing number of vehicles in storage, the schedule now calls for two vehicles a month from February 1967 through July 1967, decreasing to 1½ vehicles a month from August 1967 through November 1968. The follow-on production contract, F04(695)-67-C-0077, was originally scheduled to have delivery of 19 vehicles at a rate of two per month commencing in April 1968 and terminating in April 1969. Due to the stretch-out production schedule on the current contract, the follow-on contract now specifies 1½ vehicles per month commencing in December 1968 and terminating in December 1969.

3. In February the Improved Agena (Agena "E") Phase I effort, contract F04(695)-67-C-0123, was initiated. The Phase II development effort was scheduled to begin in mid May. Due to the lack of adequate design definition the Phase I effort was stretched out to adequately define the design requirements and eliminate the possible existence of any serious technical problems. The Phase II effort is now scheduled to begin 1 September 1967 and continue through March 1970.

4. During the period February to May, SAFSP conducted a comprehensive study of the Agena production methods. In a briefing to Dr. Flax, they proposed to eliminate the present method - which involves considerable disassembly and modification of the vehicle by using programs. The Agena program office is currently conducting a comprehensive study of user requirements which will be complete by 1 September 1967.

PROGRAM CONTROL DIVISION

Historical Data

1 JAN 1967 to 30 JUNE 1967

1. During the report period the delivery schedule for Standard Agena Vehicles, procured from Lockheed Missiles and Space Co. on Contract AF04(695)-939, was reduced from 2½ vehicles to 2 vehicles per month with a further reduction to 1½ commencing in August. This change was due to using program reductions in vehicle requirements which necessitated a delivery stretchout. Bell Aerosystems schedule for delivery of engines on Contract AF04(695)-938, was adjusted to support the stretched-out vehicle schedule.

2. Phase I program for an Improved Agena was initiated in February 1967. The first production unit is planned for delivery in early 1970.

3. Direction was initiated on 27 January 1967, for Western Electric Co. to retrofit forty-four (44) guidance canisters containing a latent defect in the pulse delay network. Scheduling and reallocations developed precluded launch or production line impact.

[redacted]

5. Capt C. Smyser was assigned to the Division on 31 May 1967, being re-assigned from SSVAC. Miss Opal Twibell transferred into the Division from SMAMA on 16 April 1967.

atch 2

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS SPACE SYSTEMS DIVISION (AFSC)
AF UNIT POST OFFICE, LOS ANGELES, CALIFORNIA [illegible]

SSVAC 15 Jul 67

SSVAC Historical Report (1 Jan - 30 Jun 1967)

TO: SMVA

1. Mission. The mission of the Agena Configuration Management Division (SSVAC) is to apply the principles of configuration management to the Agena space vehicle program with as few deviations as possible.

2. Personnel. Capt. John Straton and 2d Lts. Barda Sizemore and Bentley Stansbury have been assigned to the division. Capt. Craig Smyser was reassigned to SSVAP, and Miss Barbara Wessman left the civil service. Major Bradford is attempting to add a GS-12 civilian position to the division and up-grade an existing civilian position from GS-12 to GS-13. Support from Aerospace Corporation is now being received.

3. Activities.

a. Reviews and Inspections. Preliminary Design Reviews (PDRs) were conducted on the Velocity Meter/Velocity Meter Counter and the Electronic Event Timer. The PDR on the Improved Agena was aborted. This will cause delay in going into Phase II of the program. Combined PDR/CDRs (Critical Design Reviews) were held on the Three-Start Engine and the Command Destruct Kit. A CDR was held on Brazed Plumbing for the Agena and First Article Configuration Inspections (FACIs) were conducted on the Maximum Access Booster Adapter (MABA) and the four Rocket Engine Service Kits.

b. Configuration Control. Lockheed Missiles and Space Company (LMSC) agreed to put effectivities on Class II changes. Preliminary Engineering Change Proposals (PECPs) are being submitted by the contractors at the suggestion of the Configuration Management Division. Rigorous ECP guidelines are in preparation.

c. Configuration Accounting. The previously used configuration accounting report has been replacedwith a new, superior, Contract End Item History Report. The new report is superior to the old report in that it can be effectively used as a tool for verifying completion of engineering and documentation changes by referencing changes authorized to specific part number changes and serialized articles installed in the vehicle.

d. Configuration Identification. The Agena Configuration Management Division is reviewing the level at which it intends to control specifications. In the past, specifications have been controlled down to the level of piece part and process specifications.

e. Data Management. SSVAC continues to handle Data Management for the directorate. A formal data call system has been implemented by the Data Management Officer, Mr. Phillips, to insure that data requirements are adequately

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use on each contract, program plan, and basic ordering agreement.

4. Significant Events.

a. Improved Agena. The decision has been made to procure an Improved Agena. This major effort has had a large impact on the Configuration Management Division. Phase II of the effort has been delayed due to the unsuccessful Preliminary Design Review.

b. IG Inspection. Representatives of the Office of the Inspector General reviewed the operations of the division during the reporting period. The only significant recommendation furnished by the inspecting team was to set up a formal data call system to insure adequate data management on all contracts. This has been accomplished.

Capt.

[redacted] Major, USAF
Chief, Configuration Management Div.
Agena Program Office

1. Standard Agena Telemetry Frequency Conversion

a. Clearance was received to proceed with the conversion to S-Band. Work is now underway.

2. Command Destruct System

a. The evaluation of the Command Destruct System compatibility problem has continued throughout the first half of 1967. This problem originated in March 1966 when the ETR Range Safety Office (ETOSH) conducted a new review of the Destruct system and disapproved it. The disapproval was based on the interrelationship of the battery, receiver, and destruct unit. The destruct unit (a 1-Ohm device) drew a very large current when activated. The surge current caused the battery terminal voltage to drop to 9 volts. The receiver, designed to operate with at least 22 volts, could not continue to operate at 9 volts. After 10-20 milliseconds, the receiver output relays would deactivate, removing power from the destruct unit. Tests and calculations by LMSC indicated that the destruct unit would always detonate before relay drop-out, however ETR would not accept the statistical detonator sure-fire time and insisted that the destruct relays would remain activated unless the command was removed. To meet the requirement, SSVA initiated modification of the Command Destruct System through Program Plan 279 which was redesignated as Program Plan 303 on 1 January 1967, and which provided a wire harness to limit the surge current from the battery, preselection of battery cells, and tests on battery & receiver/decoder compatibility.

The final Design Review Meeting was held during 22-24 May 1967. Revised documentation from the meeting was expected to be released prior to the scheduled launch of Mariner-Venus in June. During the Design Review a representative of the receiver manufacturer discovered the much longer time duration requirement which existed at the proposed new low voltage limit for the receiver/decoder. Consequently, he could not agree to the revised specification on which the prime contractor had committed to AFSSD, and which was to be released following the design review. This information was telephoned by the prime contractor to AFSSD on 1 June. LMSC submitted (per request of SSVA) an addendum which would authorize additional testing by LMSC to attempt to resolve the differences between the current-voltage requirements of AFETR, and the limitations of existing equipment. After revising the addendum, SSVA authorized LMSC to implement the revised addendum to Program Plan 303.

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HISTORICAL REPORT
1 Jan 67 - 30 Jun 67
Systems Branch/[illegible]-2

1. (U) Significant Policy & Planning Developments

a. The arrival of our third program director (Colonel Keefer) within the year, the retirement of Lt Col Greenfield, Chief of Engineering, without a replacement, the removal of Maj Crawford from his reliability/quality activities to act as Chief of Engineering, the transfer of Capt Straton to SSVAC with no one to take his place, and the arrival of 25 Aerospace MTS for the first time on the program, has resulted in a shift from a systems engineering capability to a philosophy of systems management through increased dependence on the contractor.

b. A highlight of this period has been the demonstration by Major Einstein of the great value of the Engineering Management Office (EMO) function. The EMO has developed a self-checking system of managerial controls over the efforts of our division engineers that has resulted in improved communication within the SPO, more effective planning, a new orderliness to technical direction and an "inescapable" tracking of suspense items.

c. Capt Tubbesing has made further improvements to the preparation and coordination of technical statements of work (SOW). The significant result of this effort is a much more accurate definition of engineering requirements in the SOW which, with initial understanding, helps to eliminate down-stream interpretation differences.

d. New policies have been established by the SPO, as the result of Systems Branch action, which more effectively utilize the resources of the AFPRO. Each SPO member has identified his AFPRO counterpart, and will establish a personal working relationship with him. Also, information copies of all correspondence to the contractor will be directed to an individual AFPRO addressee. This improved communication should result in a better informed SPO. We have found that the AFPRO viewpoint always adds a dimension of depth to problems reported--but not necessarily researched--by the contractor.

e. A Systems Branch manpower study of the Engineering Division developed, upon Colonel Keefer's arrival, into a comprehensive analysis of the entire SPO function. The result of this study was the determination of need and approval for 25 additional technical people. Since Air Force personnel were not available, an alternate decision was made to use 25 Aerospace members of the technical staff (MTS). These are now phasing into the program.

DOWNGRADED AT 3 YEAR INTERVALS
DECLASSIFIED AFTER 12 YEARS.
DOD DIR 5200.10

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2. (U) Current Mission Objectives

a. One of the main branch activities is the technical administration of the support engineering contracts. A new contract became effective 1 Jan 67 for 390,000 manhours ($6.385 million) of engineering. Through an improved SOW on this contract, the SPO is realizing an increase of useful engineering effort of about $200,000.

b. Proposal Evaluation

This office has assisted in the fact finding/negotiations of the following contracts:

(1) Agena Production Contract - AF 04(695)-939

(2) Engineering Support Contract - F04695-67-F-0092

(3) Electronic Event Timer - AF 04(695)-589 Order No. SSD-67-22

(4) Agena Coupling Improvement Program - AF04(695)-589 Order No. SSD-67-20

(5) Production Qualification Program - AF 04(695)-589 Order No. SSD-67-18

(6) Agena Storage Contract - F04695-67-C-0168

c. Statement of Work Preparation

During this period, the following work statements were prepared and submitted to the Agena Contracts Division (SSVAK) for contractual action:

(1) Velocity Meter Counter Mod II B - AF 04(695)-589 Order No. SSD-68-24

(2) Quantic Horizon Sensor

(3) Project Cough Drop - AF 04(695)-589 Order No. SSD 67-23

(4) Agena Storage Contract - F04695-67-C-0168

(5) Electronic Event Timer Phase II - AF 04(695)-589 Order No. SSD-67-22

3. ~~(C)~~ Agena Flight Performance

Through 30 June 1967 there have been 243 Agena flights. Of this total, 150 have been of the Standard Agena or Agena D configuration. The flight success ratio of the Standard Agena is 93%. A complete resume of Agena flights is contained in the semi-annual report, "Agena Flight Summary Reports." The report covering flights through 30 June 1967 will be distributed by 15 Sep 67.

1. DEVELOPMENTS

1.1 GCE

In January it became increasingly clear that one major using program planned to proceed with full development of a Redundant Attitude Control System (RACS) and planned to fly the system as soon as development was complete. Later a second generation system consisting of a Dual Attitude Control System (DACS) would replace the entire Agena primary guidance and control system. With the advent of this dual system, the GCE would no longer be required by the major user of Agena vehicles. On 24 Feb 67 all work on the GCE development was stopped. The residual data was gathered and stored pending a possible future need for this development.

1.2 Digital Velocity Meter Mod IIA

The previous designation of Velocity Cut-off System Mod X (VCS Mod X) was dropped. The Bell contract was revised to call for individual contract end item (CEI) specifications for the DVM IIA and the Mod IIA Counter. LMSC will furnish individual interface specifications which will be incorporated in the Bell CEI's. This will lead to a cleaner set of specifications and will permit future changes to the components without affecting the "system".

The Preliminary Design Review was held at Bell on 11-13 January 1967. The PDR was unsatisfactory and repeated on 4-5 April 67. The first service test unit is scheduled to be sent to LMSC on 1 July 1967, and the first production unit will be available in Oct 67 for incorporation on AD 199 and subsequent vehicles. The Critical Design Review is tentatively scheduled for 12 Jul 67 at Bell.

1.3 Velocity Meter Counter, Mod IIB

In June it was apparent that the Velocity Meter Counter Mod IIA was not compatible with the power supplies of a major using program. Standard Agena suggested that the IIA Counter be modified for this program and that the modifications include improvements to satisfy the Improved Agena requirements. The engineering required to add the extra burns for Improved Agena would be included with very little additional cost. By satisfying this using program's need and adding the multi-burn capability, the Counter remains a piece of standard equipment and will meet known future requirements. This development is mandatory to support the using programs.

1.4 Electronic Event Timer

The EET effort was reinstated in mid-December 1966, as a study effort. LMSC presented their proposal on the revised effort on 20 January 1967. Negotiations were held on 27-28 February at SSD. The Preliminary Design Review was held at LMSC on 13-14 April 1967. Go-ahead for the Acquisition Phase was given in the form of a letter contract on 1 May 1967. In view of the Improved Agena slippage, a stop work order was issued in early June 1967 holding all work in abeyance for 90 days.

1.5 Improved Agena

The Guidance Branch has provided support for the Improved Agena Program by participating in fact-findings, specification reviews, and the Preliminary Design Review. Every effort has been made to point out the necessity for including the Guidance Subsystem in the improvement program, rather than try to use all the existing equipment. The Improved Agena provides an engine capable of five starts, increased payload capability, 90-day orbital lifetime, and an integral secondary propulsion system capable of 10 starts. However, no provision has yet been made to update the Guidance System to make it capable of controlling a multi-burn engine or a secondary propulsion system; or to increase its altitude capabilities and injection accuracies; or to make it capable of a 90-day orbital lifetime.

1.6 New Horizon Sensor Concept

1.6.1 Applied Devices (formerly Belock Instrument Corporation) completed their contract for the development of a "Solid State Horizon Scanning Technique." The objective was to develop and demonstrate a specific photo-conductive detector for use with the Applied Devices Solid State Light Beam Scanner. The objective was not reached, but most of the major problem areas were met and solved. A high degree of confidence can now be placed on the ultimate attainment of an infrared photo-conductive detector which would not require cryogenic cooling. Further effort is required to fully optimize the doping process and to develop the applicable photo-conductor deposition techniques. A follow-on contract is planned, but the sponsor has not been identified.

1.6.2 The Quantic Industries development of a "High Accuracy Horizon Sensor System" was concluded during this period under Contract AF 04 (695)-924. The technical objectives of this development were obtained. The final report will be published in July 1967. A follow-on effort is planned. The objectives of this effort will be the development, qualification and fabrication of two Quantic Mod IVA Precision Horizon Sensor Systems for orbital flight test to determine the accuracy, reliability, and other key performance parameters of the Sensor System in a Space environment. The contract duration will be 88 weeks beginning July 1967.

1.7 Barnes 13-150-33 Model IIC Horizon Sensor

In order to meet Using Program SP-14E's requirements, the last 12 GFP systems to be delivered under Contract AF 04(695)-1008 will be program peculiar. The telemetry scale factor and the procedure for nulling the control outputs has been changed. Delivery of the first modified system is scheduled for the last week in July. The changes are contracted for under ECP-23E.

1.8 Inertial Reference Package (IRP)

MIT continued the design and development of a three-axis, strapdown IRP for possible use on the Agena Spacecraft. All preliminary components of the IRP have been subjected to rigorous testing and analyses. Many second and third generation components have evolved that feature improvements extending their application beyond earlier designs. Much effort has been concentrated on circuit optimization, analysis and testing. The gyro-to-base plate thermal model has been analyzed and worst case temperature limits for base plate variations have been obtained in terms of the variations in gyro power consumption, supply voltage and thermal resistance.

Tests on the second Kearfott Alpha series gyros are nearing completion. All parameters are within specification. Delivery of the gyros for the design proof unit are expected in July. After installation, qualification testing will begin on the design proof unit. Present schedule calls for completion of all testing by September 30, 1967.

2. MAJOR PROBLEMS

2.1 Sequence Timer

2.1.1 Timer Improvements. The redesigned cam, stiffening rings, and new gear wheels have been scheduled for incorporation at the same time the improved Licon switches are incorporated. Currently LMSC is having problems getting the new gear wheels, and this is holding up the whole program. LMSC is estimating that the first improved timer will be produced by the end of July.

2.1.2 Globe Motor Thrust Bearing. In June a Sequence Timer failure experienced by General Dynamics/Convair Division was traced to an improperly installed thrust bearing in their timer motor. Inspection of several similar timer motors at LMSC found one motor (P/N 1062385-5 CCA 1470-1110) with the inner and outer bearing races reversed (documented on FEDR 325197 Suppl. 13637) UAS 358 was issued to sweep all Sequence Timers which contain Globe motors and all uninstalled Globe motors for a bearing inspection. Action is continuing at this time.

Modification of the bearing assembly is also under consideration. There are two candidate fixes, one of which looks very promising. Motors with the redesigned bearings could be available by the end of July.

2.2 Sterer Thrust Valve Bent Rods

In March during a program systems test a Sterer Thrust Valve jammed in the open position. Subsequent failure analysis showed that the solenoid piston had wedged itself in the coil due to a bend in the rod which connects the piston to the bellows assembly. Examination of other units showed this same condition to exist in varying degrees in a number of valve clusters.

Through discussions with Sterer it was determined that the rods had been improperly heat treated, which permitted them to warp after assembly. All units have been retrofitted with new piston assemblies.

2.3 DVM Chopper Failure

In May an Agena Space Vehicle experienced an in-flight anomaly in which the Velocity Meter failed to shut down the main engine at the predetermined velocity. Investigation of flight data and test records indicated the probable cause to be the failure of a synchroverter switch (chopper). All Agena vehicles were grounded at this time until corrective action could be accomplished. The failure mode was determined to be a broken wire between the chopper mechanism and pin 7 of the header, due to metal fatigue of the wire when exposed to a vibration environment of 30 g's. The design of the switch allowed movement of the chopper mechanism relative to its cylindrical sleeve, and the wire was flexed by this motion.

Investigation revealed a series of unreported failures which had occurred during the past several months. One chopper failure at LMSC was not reported to SSD nor was corrective action initiated. Six of the seven failures which occurred at

[redacted]

Bell Aerosystems Co were not reported to LMSC. In addition, there were three failures at the part level at Bristol Co, the part supplier, and one at Bell. With the flight failure, this made a total of 13 known failures.

It was also determined that the same part was being used in the Barnes Engineering Co Horizon Sensor. Analysis showed that the Horizon Sensor performance was not in great danger from a chopper failure. It was therefore recommended to use the Horizon Sensors in present condition until testing or analysis indicates otherwise.

Corrective action required to fix the chopper was to secure the mechanical vibrator in place with an epoxy. Existing systems will be reworked to new configuration.

In addition, the failure reporting and corrective action system at Bell was thoroughly reviewed and action taken to implement effective procedures.

2.4 Guidance J-Box Pulse Engineering Transformer Failures

Investigation of several transformer (P/N 1461900-001) failures in the Guidance J-Box revealed a failure mode which consisted of open windings in the primary and/or secondary caused by expansion and contraction of transformers materials. Since most flight missions do not require the function of the suspect transformer, the disposition of the majority of boxes was "use as is". For those programs desiring the use of the transformer, the recommended fix consisted of temperature cycling the J-Box and retesting. Failed transformers will be replaced with units which have been screened by a similar temperature cycling test.

3. PERSONNEL

The Guidance Branch is now operating with four of its six authorized officers. These are Maj Moore, Maj Hirsh, Capt Cronquist and Lt Wood. Lt Col Wm. Gallup departed in May for flying duty in SEA, although he had been TDY for training since December 1966.

HISTORICAL REPORT
1 January 1967 - 30 June 1967
Mechanical Branch
SSVAE-4

Subsystem A

1. Titan III B/Agena

The FACI of the booster adapter optional kit for this vehicle was conducted during February 1967. As the result of this FACI, changes to the Destruct/Discrete Junction Box Assembly specification were required and the preparation of a Part I booster adapter specification was initiated. It is estimated that these actions will be completed during July 1967. The first optional kit will be delivered to the using program early in the next report period. The booster adapter has, to date, been manufactured under a using program contract and has successfully completed several flights.

2. Strengthened Booster Adapter

During the first four months of this calendar year LMSC subjected a new .160 inch thick booster adapter to a series of qualification tests. It was the objective of this program to verify the capability of the structure to withstand to ultimate levels, the flight loads due to maximum acceleration and to maximum airloading. A secondary, yet significant consideration was that of determining the capability of the adapter to withstand a non-uniform pattern of stress due to an asymmetrical temperature distribution coupled with concurrent mechanical loading due to acceleration. Previously a similar test with a slightly different distribution caused a .143 in adapter to buckle prematurely.

A planning error occurred; in that the aft Y-ring and tank skirt assembly was not aged to the required -T6 condition, and buckling failure did eventually take place unexpectedly. A second assembly was manufactured and the structure withstood all loading, including a test to 131% of limit load prior to failure. The latter took the form of a small buckle above the nitrogen fill door. As test objectives were achieved a qualification certificate was issued.

Although some degree of qualification to an asymmetrical temperature distribution (80/60) was demonstrated, it remains for the technique referenced in the booster adapter specification to be exercised to properly evaluate structural capability for a given mission. This method is discussed briefly in paragraph 5 below.

3. Zipcord Program

As noted in the last report, the program contractor, LMSC, had submitted a plan to investigate the cause of the Zipcord jacket failures. This plan was evaluated but no decision to continue or cancel the program was reached.

4. Agena Propellant Tank Discrepancies

Since the last report, concrete efforts have been made to improve the overall quality of the Agena propellant tank in view of continuing quality problems. Particular attention has been given to the areas of surface imperfections (scratches, pits, etc.) and weldment discrepancies (porosity, thermal cracks, etc.) which reflect the contractor's level of workmanship. Of those tank assemblies found discrepant, to one degree or another, final analysis revealed the condition to be acceptable from a performance standpoint. The problem, therefore, is considered a conflict between engineering specification requirement trying to maintain a level of manufacturing quality above what is demanded by the flight environment. This, together with certain inherent difficulties in the welding of 6061-T4 aluminum material, has resulted in several engineering/quality assurance disagreements, resolved finally by contract waiver action.

The following major steps have been taken to alleviate this problem:

(a) The contractor has proceeded to upgrade his tooling, particularly that used during the welding operations.

(b) Welding equipment is being improved, particularly with the aim of reducing the wandering of the AC weld arc. This action contributes to a surface melting condition away from the weld bead which manifests itself eventually as fine surface cracks.

(c) A coordinated effort is presently underway to relax certain specification requirements in line with defect magnitudes found acceptable by fracture mechanics analyses. A new criteria is also being developed to aid in the evaluation of porosity and its effect on weld strength.

The efforts outlined above are believed to be an approach to resolving the tank quality problems.

5. Determination of Asymmetrical Heating Effects on Standard Agena Vehicles

During this report period test data was gathered and collated as part of the final effort to develop a reliable analytical technique for determining the effects of an asymmetrical temperature distribution on the strength of the Agena vehicle. The data were used to verify the accuracy of a computer program based largely on the modified cylindrical shell equations of Flügge. Specifically, this program is intended to provide values for stress as a function of angular position around the structure under consideration. As finally documented, a thermal stress decrement due to asymmetrical heating can then be determined and subtracted from the stress capability based on uniform heating. The result should be the final capability expressed as a decreased value of structural margin.

As future flight profiles will reflect various trajectory parameters, this technique should prove invaluable in terms of its adaptability and ultimate accuracy. To date, a mission has not required its use although that time is probably fast approaching. The method, nevertheless, has been exercised in conjunction with the qualification test of the Agena .160 booster adapter mentioned above. Comparison of predicted stress values with test measurements indicated very close agreement. In conclusion, the value of this program, together with the advancements realized in the area of small scale structural testing, have more than justified the cost of the total endeavor. Furthermore, with the dissemination of program information, the Aerospace industry should realize significant benefits in terms of conducting future buckling tests of cylindrical, monocoque structures. Rather than relying on empirical data from costly and time consuming test programs, this analytical technique may be employed with confidence.

6. Plumbing Improvement Program (Flared Joints)

It was previously reported that an effort had been made by LMSC to upgrade the quality of tube flares in separable connectors in an attempt to reduce cold gas leakage once installed on the vehicle. The development of an orbital flaring machine has promised this reduction in gas leakage, yet obstacles have arisen to preclude the adoption of the improved flaring technique on a 100% production basis. A program evaluating the orbital machines manufacturing accuracy was therefore initiated during this period. The results of this program were compared on a 3 sigma statistical basis with the existing process specification LAC 0942F and the updated NASA Standard MC 146. A side program was also performed to determine the effect of tube bending on flare quality.

The primary phases of work have been completed and results are as follows:

(a) For 1/8 hard CRES it is possible to adopt MC 146 Revision C with the exception that the external angle requirement will have to be relaxed to $66^{\circ}{}^{+4^{\circ}}_{-2^{\circ}}$.

(b) For 5052-0 Aluminum Alloy it is possible to adopt MC 146 revision D with the exception noted in (a).

(c) For the annealed stainless steel and 6061-0 aluminum materials significant improvements in quality were not evident and therefore the existing process requirements must stand .

(d) At this time all inspection work has yet to be completed although it does appear certain that tubing cannot be bent after flaring without experiencing some degree of distortion.

The overall conclusion of this program is that a marked upgrading of flare quality can be achieved for certain primary materials as previously noted. However, it is not going to be possible to adopt a single set of updated process requirements. The appropriate specification, as revised, will reflect differing sets of flaring requirements, each to be invoked as deemed applicable by the design engineer, (i.e., for high pressure cold gas systems 1/8 hard CRES tubing will be necessary and flared in accordance with MC 146 revision C.)

At this time an effort is underway to revise the process specification LAC 0942 by 25 August 1967.

7. Incorporation of Permanent Joints on the Standard Agena Vehicle

During this report period concluding reports were received describing in detail the development and qualification efforts required to incorporate induction brazed fittings on the Standard Agena Vehicle. The documents reflected an accurate and thorough program of design, test and evaluation necessary for production modifications to be effected with confidence. A progressive inspection was also conducted by Air Force personnel to insure engineering drawing and process control adequacy. Of significance during this review was the attention given to radiographic inspection and its bearing on the acceptability of brazed fittings. To this end a 100% inspection program was instigated to gain confidence after which a sampling plan is to go into effect.

To date several Agena vehicles have received brazed pneumatic system plumbing lines as part of their normal build-up. Program peculiar vehicles have also received a brazing retrofit of certain optional kits serving attitude control functions. This changeover from the separable connector design has not been subjected to the rigors of pre-launch checkout or of the flight environment; however, a high degree of confidence does exist insofar as the integrity of this design is concerned.

In the future, effort will be made to maintain a high level of process control which together with good workmanship will insure to the largest extent a structurally sound and leak-free plumbing system. As part of this work, higher quality thermocouples will be sought as well as sensitive, portable, gas leak detectors. Programs will also be undertaken to replace more separable connectors with brazed fittings thereby reducing in proportion any leakage potential.

Subsystem 2

1. Agena Propulsion Performance

During the period of this report 16 Agena vehicles were launched. All of these launches used the YLR-81-BA-11 rocket engines: Of the 15 vehicles which were given a chance to perform on the booster, 14 were successful as far as the propulsion subsystem is concerned. The single gross propulsion failure was the NASA ATS sattelite which did not achieve a proper orbit due to a failure to achieve an engine restart. This failure was traced to the oxidizer propellant isolation valve which did not close; thus allowing engine heat to boil propellants out of the oxidizer pump and sump starving the engine inlet at restart. The valve underwent a rapid modification program to prevent future occurrences. This program was successful and all vehicles are being retrofitted with the new design.

2. USAF YLR-81-BA-11 Rocket Engines

The engines continue to exhibit the chamber pressure anomaly (P_c dip) at an alarming rate. Nine such occurrences have now been recorded since mid 1966 and the last two have occurred on consecutive launches.

Project "Coughdrop" was initiated in late 1966 as a high priority program to isolate the causes of failure. To date more than $1.4 million has been spent with less than conclusive results. The failures have been reproduced in test at both Bell Aerosystems Company (BAC) and in the altitude chambers at Arnold Engineering Development Center (AEDC). The occurrence has been shown to be the failure of one or more ball bearings in the turbine pump assembly. The main unknown is the triggering mechanism, since the failures are thermally induced by adverse heating rates in the pump. An exhaustive review of the flight and ground test history, manufacturing documentation and "cradle to grave" handling has been conducted in an attempt to isolate changes which might have occurred in any phase of the cycle which could contribute to the failures. Two such correlations were found:

(1) When, for various reasons, the MIL-L-7808D oil was changed to MIL-L-7808E and then 7808F revisions, the latest revision was automatically incorporated into the engine in the field. A detailed review of the military specification revisions indicated it would have been better to stay with the "D" revision. However, a return to the "D" oil has apparently not solved the problem since the last two dips occurred after the change back.

(2) BAC changed gear vendors in mid 1965 which apparently resulted in a block of lower quality gears in the group of engines which exhibit a high anomaly rate. Test and retrofit planning is underway in case a gear change becomes mandatory.

An extensive test program has been conducted at sites previously mentioned which seems to indicate the trigger mechanism may also be associated with a flow of combustion products through the gearcase resulting from a leaking turbine drive seal.

A high priority effort is now underway to determine running heat and leak rates in the pump. Parallel efforts are also underway to:

(a) provide a high strength high temperature ball bearing for this application,

(b) provide better quality seals to maintain internal gearbox pressure as well as prevent the flow of combustion products into the assembly.

The effort, including qualification testing, will be conducted as rapidly as possible but any ECD earlier than December 1967 is very optimistic.

3. 3-Start YLR 81-BA-11 Rocket Engine Kit

A three start capability for the YLR-81-BA-11 is progressing well. The design was selected because of a substantial weight saving over the multi start XLR-81-BA-13 engine. One test failure of the bracketry associated with the triple starter assembly has been experienced. The failure was caused by the use of a "non-flight" bolt in a vibration test fixture. No significant cost or schedule impact is forecast at this time and hardware deliveries are slated for the August-September 1967 time period.

4. Improved Agena Program

a. Approval was secured to run a modified contract definition phase to define the work required to develop the 8133 rocket engine and integral secondary propulsion system (ISPS) for the Agena vehicle. The definition phase started 13 February 1967 and is still in progress as of this report. The effort was funded under P.E. 6.44.09.12.4 and contracted for under contract F04695-67-C-0123 with Lockheed Missiles and Space Co (LMSC) as prime contractor and Bell Aerosystems Company (BAC) as subcontractor for the engine work. During the definition phase (or Phase I as it became known), the BAC model number of the engine was changed from 8133 to 8533 and the engine was given the USAF designation of XLR 81-BA-15. The

Improved Agena vehicle was given the military designation of S-60 Space Vehicle.

b. Very briefly, the primary objectives of the Improved Agena Program are to increase vehicle payload by converting the presently used unsymmetrical dimethyhydrazine (UDMH) Fuel to a 50/50 by weight blend of hydrazine and UDMH, and changing the oxidizer from inhibited red fuming nitric acid (IRFNA) to nitrogen tetroxide (N_2O_4). An additional objective is to increase the orbital maneuvering capability of the vehicle by incorporating a multistart capability on the 8533 engine (similar to that on the XLR 81-BA-13 Gemini Agena Target Vehicle Engine) and by development of the ISPS which will provide orbital adjust capability and use propellants from the vehicle main tanks.

c. Accomplishments made to date during the definition phase are the following:

(1) Trade-offs were performed to define the design approach to be taken during the follow-on development phase (Phase II). The analyses and studies which serve as input to these trade-offs are continuing and evaluation of the trade-offs is in progress as of this report.

(2) Tests were performed to determine materials compatibility, performance and heat rejection of various injector configurations, thermal properties of the new propellants, and the capability of existing weld techniques to meet the environments imposed by the N_2O_4 oxidizer.

(3) Space allocations were made and interfaces defined.

(4) Key Part I CEI specifications were drafted for contractual use during Phase II.

(5) Various plans, such as contamination control reliability and EMI control, were drafted for use in Phase II.

d. In summary, the definition phase (which is now essentially complete) accomplished its objectives in that several key technical problem areas were discovered to exist which had previously been unsuspected. More realistic estimates of the cost and schedule for Phase II were developed. Present plans call for finishing Phase I in August of 1967 and giving go-ahead for Phase II shortly thereafter.

5. Pressurization System

a. The present aluminum propellant vent coupling has experienced a continuous history of discrepancies due to both the leakage caused by scratches and gouges on mating surfaces, and failure to meet specification pad-hold requirements during several test programs.

At the end of the last report period work was initiated on the Coupling Improvement Program. The primary objectives of this program are three fold. First, the coupling material has been changed from aluminum to stainless steel in order to eliminate or reduce the possibility of nicking mating surfaces. The change to steel will also enable the coupling to be installed into the vehicle plumbing system by means of a permanent induction brazed joint. Secondly, to assure a wet-pad-hold capability of 15 days, spring-loaded teflon seals (Omniseals) have been incorporated in the vent coupling and have satisfactorily completed exposure tests during development. Thirdly, in order to prohibit the transposition between any combination of gas fill and propellant vent valves, and thus eliminate pad hazards, four (4) distinct sets of non-interchangeability tongue and grove combinations have been introduced in the design.

The improved coupling is scheduled to be incorporated on vehicle AD 205 during the first quarter of 1968.

b. As mentioned above, the propellant isolation valve (PIV) was found to have caused a flight failure by not closing completely after engine first burn. A ground test program revealed that the main seal, against the moving blade of the valve, was able to be vibrated or shocked out of its retaining ring. The seal would then fall down into the path of the blade, jamming it open. A retaining method was designed into the seal and ring thus preventing recurrence of this failure.

1142

Procurement Division
Historical Data
1 Jan 1967 to 30 June 1967

1. During the period, Procurement Division (SMWAK) supported the Agena Directorate by issuing and administering a variety of contracts for the following supplies and services:

Standard Agena Vehicles
Propulsion Subsystems
Guidance and Control Subsystems
Velocity Meters
Horizon Sensors
Spare Parts and Logistics Support
Modification Kits
Repair Services and Storage
Sustaining Engineering and Studies
Launch Services at AFETR & AFWTR
Parts Qualification Program (PQP)

The above contracts have a value exceeding $500,000,000.

2. During this period, Hq USAF authorized development of an Improved Agena in January 1967. Letter Contract F04695-67-C-0123 was issed in February 1967 for Phase I of the development program. The definitive contract was distributed in June 1967. Start of the Phase II effort originally scheduled to start during this period was slipped due to changes in program requirements and additional effort to be performed as part of Phase I. The requirement for implementing the "Cost/Schedule Planning and Control Specification" (C/SPCS) was established under Contract C-0123 also.

3. Additional new procurements were initiated during this period as follows:

Letter Contract F04695-67-C-0077 was issued to Lockheed in January 1967 to procure nineteen (19) additional Agena Vehicles.

Letter Contract F04695-67-C-0092 was issued to Lockheed in March 1967 to purchase Engineering Support and Studies for the Agena program.

Definitive Contracts F04695-67-C-0075 and F04695-67-C-0150 were issued in March and June 1967 respectively for Launch Services at the AF Eastern Test Range and AF Western Test Range.

Basic Ordering Agreement Orders under Contract AF04(695)-589 were issued as follows:

No. 18 - Production Qualification Program
No. 20 - Brazed Coupling Development
No. 21 - Agena 3 Start Engine Development
No. 22 - Electric Event Timer Development
No. 23 - Project Cough Drop

4. Letter Contract AF04(695)-939 with Lockheed, for procurement of thirty six (36) Agena Vehicles was negotiated in June 1967.

5. Personnel changes during the period involved assignment of a new Military Division Chief, a Procuring Contracting Officer and two (2) buyers.

[redacted] Lt. Col USAF
Chief, Procurement Division
Agena Program Office

OPERATIONS DIVISION
Historical Data
1 January 1967 to 30 June 1967

1. (U) SSVAO has been operating at 70% authorized strength throughout the period except after the departure of Capt Norman Lee on 9 June. Lt Gordon Waterous, Capt Lee's replacement, reported in on 30 June. Maj Elmer T. Davis, Jr, was designated as Chief of the Division 28 Mar 67.

2. ~~(C)~~ A Memo of Agreement was drafted between SSBG and SSVA concerning mutual responsibilities for procurement of BTL radio guidance support for the TIIIB. Final signature has been delayed pending comments on the proposed Memo from Program 110, which is concerned about giving too much control of the guidance function to the TIII SPO.

3. (U) The SLV-2G (Long Tank TAT)/Agena interface specification prepared by LMSC under SSVAO direction was signed off by LMSC, DAC, SSVA, and SSVX in January 1967 and released.

4. (U) LMSC began preparations, under SSVAO direction, on the SLV-3A (Long Tank Atlas)/Agena interface specification. Coordination copy of the completed specification was sent to SSVA 30 June 1967.

5. ~~(C)~~ The activation of the Vandenberg AFB Ground Guidance Station (GGS) 6-1 is proceeding on schedule. GGS-4 will be turned over to ADC on 1 April 1968. The principle events that have occurred are:

a. (U) A Supplemental Agreement was negotiated with Western Electric Co (WECo) for $605,000 to provide all necessary radar equipment modifications and activities to activate GGS 6-1.

b. (U) The facility criteria for GGS 6-1 was completed by WECo and furnished to the Corps of Engineers. The Corps provided the detailed design package, the contract was let, and the facility contractor has been working since April 67.

c. (U) The status of facility work on 30 Jun 67 was: Monolith completed, Antenna Pad completed, Terminal Building in final completion stage, Control Room and other GGS modifications almost finished. The total project should be completed in mid July 67.

d. (U) The three Titan I IOC Radar Systems received from Ellsworth AFB were found to be corroded and were therefore scrapped. Two other Titan I systems were received from Cape Kennedy as replacements for the GGS 6-1 job. Additional items of equipment will be obtained from the Titan I sites at Mt Home and Lowry.

DOWNGRADED AT 3 YEAR INTERVALS
DECLASSIFIED AFTER 12 YEARS
DOD DIR 5200.10

6. (U) The Guided Missile Test Station (GMTS) replaced the laboratory model GMTS on SLC-4 West during May 67. The removed unit is being modified for installation at SLC-3 West.

7. (U) Activities in Support of the Proposed TIIID Program.

a. (U) An experiment designed to measure the effect of Solid Rocket Motor Flame Attenuation (Project See-Thru) at X band frequencies was flown on TIIIC-10. The purpose is to predict possible flame attenuation that could affect the WECo Ground Guidance Radar to MBGE R.F. link. WECo participated in the project planning but at the time of this report has not completed the data review. Present planning is to perform similar tests on TIIIC-5 in Dec 67.

b. (U) A TIIID guidance accuracy and error analysis updated report was completed during this period. The significant results were that the major error contribution was due to thrust vector misalignment, and that Kalman Filter techniques result in appreciable improvement of accuracy and reduction of error effect. The TIII SPO has informed SSVAO and WECo that the TIIID specification requires implementation of techniques to reduce thrust vector misalignment.

c. (U) To date no program go-ahead has been given for TIIID. The continued slippage of the program will render invalid many of the results of the guidance accuracy study. Also, if no attempt is made to retain contractor personnel who are familiar with TIIID and the guidance study, a significant time advantage will be lost. A significant refamiliarization time period will be required for new personnel who are taken on to accomplish the guidance equation task when the program is given go-ahead. This has been brought to the attention of the TIII SPO and SAFSP.

8. ~~(C)~~ 846 Program.

a. ~~(C)~~ During the last six months modifications have been made to the Program 846 guidance program to allow split shaping of the pitch program for their mission, i.e., they will have two basic booster pitch programs, one for low inclination missions and one for high inclination missions. Present planning is for implementation of the split shaping during the next six months.

b. ~~(C)~~ In conjunction with the split shaping for the pitch program WECo has performed an extensive look angle study to determine if the radar look angles will be acceptable with the new Pitch Programs. One result has been to design a ferrite attenuator switch. This will permit elimination of the Dorsal/Ventral antenna interference region that currently exists. The ferrite attenuator will be incorporated within the next six months.

c. (U) Ground Guidance station 6-2 at VAFB has been fully activated since 15 Mar 67 and is now providing all operational support for Programs 846 and 770. NASA Delta and NASA/Agena are programmed to move to GGS 6-2 in Feb 1968.

9. (U) Program 110.

a. (U) An Acquisition Aid system for use with the WECo ground guidance radar has been designed and is near completion in GGS #4. The system uses Range Safety Tracking data to provide pointing information to the WECo Radar Antenna.

b. (U) Mission Safety Program (MSP). Implementation of the Mission Safety Program has been deferred until implementation of the Acquisition Aid. The MSP will be located in the off line computer utilized for processing the Acquisition Aid Tracking data provided by range safety. It is anticipated that the MSP and Acquisition Aid will be completed in July 67.

c. (U) A look angle study has been initiated for an "extended life" follow-on vehicle for Program 110.

10. (U) A consolidated contract was negotiated with Western Electric Company for all WECo hardware supporting the 846, 770, Titan III, NASA/Agena and Improved Delta Programs. Full implementation of AFSCM 375 configuration management has also been placed on all WECo hardware for the above programs.

11. (U) A number of Western Electric hardware problems occurred during the current report period. Significant among these were:

a. (U) A latent defect in the G-346308 pulse delay network, manufactured by Andersen Laboratories, was uncovered which resulted in questionable reliability of forty four (44) series 600 missile borne guidance units. Recycle and repair had to be effected from three launch sites and two contractor plants. Through judicious planning no production or launch impact occurred.

b. (U) Questionable J-8 connectors were uncovered during production sample testing. This problem resulted in a two month production stoppage effective from 1 June, which will continue to 31 July. No serious schedule impact is contemplated.

12. (U) Guidance System, General.

a. (U) In the last six months WECo/UNIVAC guidance has guided eleven program 846, 770, 110, NASA/Agena and NASA Delta W.T.R. launches without a guidance system anomaly.

b. (U) A proposal was submitted to SP-6 for guiding an Atlas/Agena vehicle from ETR using [illegible]/UNIVAC guidance. This proposal was significantly less than the cost of the G.E. guidance that will be used. Because of the tight schedule, however, it appears SP-6 will use the G.E. guidance system.

13. (U) ETR Launch Complex 14 was deactivated and turned back to the Range except for the Blockhouse and the Propellant Transfer Unit (PTU) building. Pending further disposition, the Agena electrical and mechanical equipment will be stored in the Blockhouse and the PTU units will remain in the PTU building.

14. (U) Space Launch Complex (SLC) 3 East has been placed on a standby status since the last PRIME launch. Several of the Agena AGE items have been transferred to SLC 3 West for the Thorad modification.

15. (U) Agreement was reached with NASA to transfer the Vehicle Systems Test (VST) Complex 10 to SAFSP. VST C10 was used and modified by NASA for the Gemini Agena Target Vehicle Program.

16. (U) Captain Norman Lee, the Chairman of the SLC-3W Complex Modification Working Group was transferred out of SSD 9 Jun 67. The chairmanship of the group was turned over to Captain F. R. Anderson (SSVX). SSVAO continues participation in the modification of the Complex, but in a reduced role due to small amount of LMSC work remaining and to lack of personnel. Target date for completion is late August 1967.

17. (U) Contract F 04695-67-C-0075 was negotiated and definitized during the period for $4,568,000 Target Price. This contract provides the Agena launch capability at the Eastern Test Range from 1 Apr 67 through 31 Mar 68. There are six launches scheduled under the contract.

18. (U) Contract F 04695-67-C-0150 was negotiated in June 67. It will not be definitized until 30 Sep 67. This contract buys the Agena launch capability at VAFB from 1 Oct 67 through 30 Sep 68. The Target Price is $17,132,000.

19. (U) The Santa Cruz Test Base Sustaining Contract was negotiated and definitized during the period. The contract guarantees the capability to test Agena vehicle systems while hot firing the engine when the need arises. It also provides the pyrotechnic testing and inspection required to support Agena users. The contract Target Price is $1,113,000. The contract period 1 July 67 through 30 June 68.

[illegible]
Plan No. [illegible]
[illegible] July [illegible]

30

"Final Customized Agena Program Plan." This document defines Lockheed method of satisfying the requirement produce peculiarized vehicle rather than "standard" Agenas.

CUSTOMIZED STANDARD AGENA

Support Engineering Program Plan

Contract F04695-67-C-0072

1. GENERAL

Standard Agena was initially configured to satisfy stated mission requirements of the then existing using program to be "used as is" except for planned optional and program add-ons. The emergence of new using program(s) and/or changed mission requirements, particularly during the last two years, renders the essentially unchanged Standard Agena configuration less than ideal for adaptation to present and foreseeable future usage. The using programs are consequently obliged to "work around" or implement changes to the basic Agena in order to accomplish real mission objectives of today. The resultant impact to the Standard Agena concept is that the production-line vehicle must be modified following Standard Agena system test, and even disassembled in some instances to permit removal of outdated equipment and harnesses. Program substitute equipment is then installed, and test re-validation of the basic vehicle is required.

Authorization for preparation of this program plan is as recorded in Official Appendix No. 7 to the Standard Agena Technical Direction Meetings.

2. OBJECTIVE

The objective of this program plan is to conduct a study concerning update of the Standard Agena concept and production-line activity to permit fabrication and assembly of vehicles in accordance with present using program needs. The immediate objective is to define a customized Standard Agena vehicle for Programs 846 and 110, using only that basic and optional equipment desired by those programs. Program-peculiar equipment and equipment bracketing will also be identified that should be included during initial fabrication and assembly to permit one-time build-up without unplanned later tear-down. The long-range objective of the Customized Standard Agena Program (not part of this plan), is to eliminate obsolete Standard Agena equipment such as the [illegible] Module, Safe/Arm [illegible], and replace them with program-developed equipment commensurate with present-day mission requirements.

Standard Agena
Program ______________________________ Date ______________

SAMSO Contracting
Officer Approval ______________________________ Date ______________

F-113

[illegible]

27 July [illegible]

APPLICABLE DOCUMENTS

Documents applicable to the effort conducted under this plan are as defined herein.

4. TASK STATEMENTS

Tasks to be included under this plan will include the following:

a. Study

(1) Program 846

(a) Creation of a Part I and Part II specification for the Program 846 Customized Agena;

(b) Compilation of a Program 846 Customized Agena equipment list;

(c) Creation of a Program 846 Customized Agena test plan (including IATV);

(d) Creation of a Program 846 Customized Agena manufacturing plan (tooling, etc.);

(e) Creation of a detailed implementation schedule;

(f) Preparation of a cost analysis to accomplish the tasks;

(g) A definition of what contractual and documentation changes are required to accomplish the tasks (Agena and using Program);

(h) Creation of a Program 846 Customized Agena Configuration Management Plan;

(i) Creation of Program 846 Customized Agena top assembly drawings;

(j) Preparation of a summary proposal that will form the basis of the production contract ECP.

(2) Program 110

The same tasks will be accomplished as defined in 4.a.(1) above for the Program 110 Customized Agena.

b. Analysis and Design

As applicable in 4.a above.

c. EMI Design

As applicable in 4.a above.

d. Reliability

As applicable.

e. Producibility

As applicable.

f. Parts and Material

As applicable.

g. Quality Assurance

As applicable.

h. Transportability

As applicable.

i. Safety Engineering

The concepts of MIL-S-38130 shall be used as a guide in the performance of this plan.

j. Air and Water Pollution Control

Not applicable.

k. Human Engineering

As applicable.

l. Maintainability

As applicable.

m. Documentation

Upon conclusion of the effort under this plan, a brief summary will be prepared and submitted to SAMSO (satisfying the requirement of Item [illegible] of Exhibit "B" to this contract). Copies of other documents created under this plan, in draft form, shall accompany submittal of the summary.

5. REPORTING REQUIREMENTS

Problems which may affect technical progress or schedule compliance shall be communicated to Headquarters SAMSO (SMAK/PMO). A project leader shall be named by the Contractor in writing to Headquarters SAMSO (SMAK/PMO) upon the Contracting Officer's approval of this program plan.

Plan No. 25

27 July 1967

6. RESOURCES (Engineering Estimates)

a. Financial

(1) Dollars: None

(2) Manpower: 5863 man-hours

(3) Manloading:

Months	1	2	3
Man-hours	1735	2208	1920

b. Equipment

Not applicable.

c. Facilities

Not applicable.

7. SCHEDULE (See attached sheet)

The final report will be submitted by LMSC to AFSSD on 30 September 1967.

[illegible]IAL DRAFT

6

PROGRAM PLAN 325 -0092

152

Maj Crawford

General

- Standard Agena initially configured to permit "use as is"
- New Programs and changing requirements now negate "use as is"
- Present usage requires various degrees of modification, disassembly, equipment substitution, and retest.

Objectives

- Immediate - customize production line for major programs
- Long range - utilize program developed hardware to re-establish Standard Agena System concept

Tasks

- Define using program configurations.
- Prepare customized equipment lists
- List outdated basic and optional equipment
- Define impact upon planning, procurement and testing per omitted equipment.
- Define impact upon manufacturing, schedule, system test per customized configurations
- Summarize configuration management/documentation
- Summarize long range objectives

Resources

36 manmonths

Schedules

3 months	-	Prelim. Report	1 Sept. 1967
		Final Report	30 Sept. 1967

PP 325

11 37 >

Plan No. 325
26 June 1967

CUSTOMIZED STANDARD AGENA
Support Engineering Program Plan
Contract F04695-67-C-0092

1. GENERAL

Standard Agena was initially configured to satisfy stated mission requirements of the then existing using programs to be "used as is" except for planned optional and program add ons. The emergence of new using program(s) and/or changed mission requirements, particularily during the last two years, renders the essentially unchanged Standard Agena configuration less than ideal for adaptation to present and forseeable future usage. The using programs are consequently obliged to "work around" or implement changes to the basic agena in order to accomplish real mission objectives of today. The resultant impact to the Standard Agena concept is that the production line vehicle must be modified following Standard Agena system test, and even disassembled in some instances to permit removal of outdated equipment and harnesses. Program substitute equipment is then installed and test revalidation of the basic vehicle is required.

2. OBJECTIVE

The objective of this program plan is to conduct a study concerning update of the Standard Agena concept and production line activity to permit fabrication and assembly of vehicles in accordance with present using program needs. The immediate objective is to define a customized Standard Agena vehicle for each major program using only that basic and optional equipment desired by the program. Program peculiar equipment and equipment bracketing will also be identified that should be included during initial fabrication and assembly to permit one-time-build-up with no planned later tear down.

Standard Agena
Program Approval ______________________________ Date ____________

AFSSD CONTRACTING Date ____________

As limited by paragraph 4(a)(8) below, the long range objective is to eliminate outdated Standard Agena equipment such as the Guidance Module, Safe/Arm boxes, etc., and replace these with program developed equipment commensurate with present day mission requirements. By proper incorporation into the Standard Agena, of Program developed equipment such as the dual attitude control system (DACS) and Safe/Arm boxes with telemetry instrumentation matrixes will reestablish the Standard Agena as a complete system capable of satisfying present day basic mission objectives. Customization would gradually become less signficant program to program with greater flexibility for vehicle late reassignments as flight schedules and newly created programs of the future may necessitate.

APPLICABLE DOCUMENTS

Not applicable.

4. TASKS

a. Study

Contractor studies will be conducted as follows:

(1) A review of each using program vehicle configuration definition will be made. Required ~~C~~changes to Standard Agena configuration and equipment subsequent to Standard Agena DD250 will be itemized.

(2) A customized Standard Agena configuration (equipment list) will be compiled for each using program that requires significant change to the basic Agena. Program peculiar equipment which should be installed during initial vehicle assembly will be included. Structural holes and bracketry to accommodate Program equipment will be noted for incorporation during

PP 325

(3) A list of outdated basic and optional equipment will be compiled with quantity reference to the master vehicle schedule.

(4) A statement of impact upon planning, procurement, scheduling, production, incoming and acceptance testing, for the outdated equipment will be made.

(5) A statement of impact upon Standard Agena System Test will be made.

(6) A statement of impact upon manufacturing schedules and activities as a result of the new customized configuration(s) will be made.

(7) A summary of proposed configuration management/documentation will be prepared.

(8) A summary plan will be provided that describes the long range objective for replacing outdated protions of the present Standard Agena with using program developed equipment that will in turn permit achievement of a maximum "common" and complete Standard Agena system.

(b) Analysis and Design

As required

6. RESOURCES

Manmonths: 18

Months:	1	2	3	4	5	6	7	8	9	10	11	12
							6	6	6			

Preliminary Report - September 1, 1967

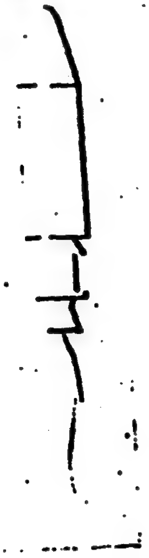
Final Report - September 30, 1967

#14

28 Jul 67

28 Jul 1967, meeting at Lockheed attended by
Gen Cooper, Colonels Hamilton and Smith.
Briefing material supplied.

STANDARD AGENA



STD. AGENA CONTR. REQUIREMENTS

AF 04(695) 939/0077

VEHICLES

- O TOTAL ON CONTRACT 55
- O DEL. TO DATE 12

RATE
2 PER MO THRU JULY '67
1 1/2 PER MO BAL. CONTR.

OPTIONAL

- O TOTAL ON CONTRACT 630
- O DEL. TO DATE 210

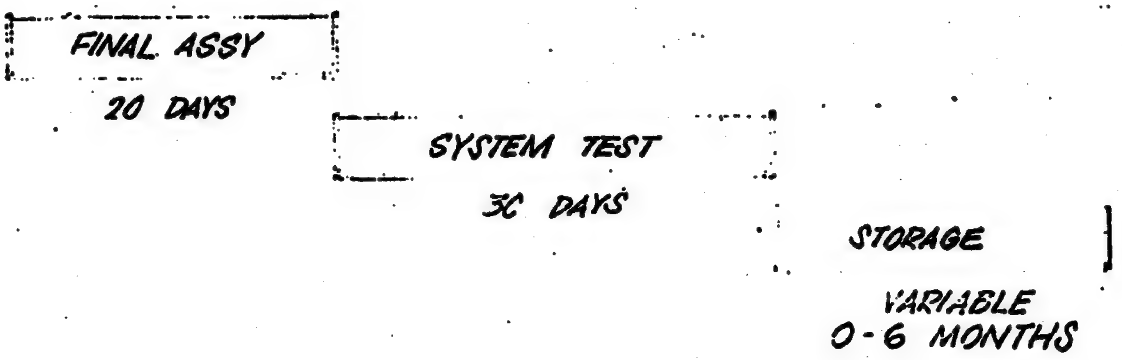
SPARES

- O TOTAL ON CONTRACT 748
- O DEL. TO DATE 602

USING PROGRAM ALLOCATION

846	110	770	OTHER
16	21	10	8

STD. AGENA TYPICAL SCHEDULE



FINAL ASSY

20 DAYS

SYSTEM TEST

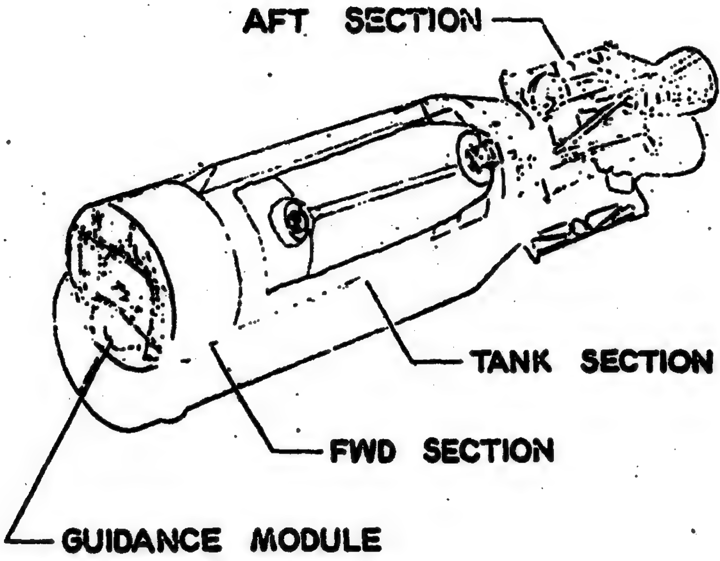
30 DAYS

STORAGE

VARIABLE
0-6 MONTHS

BASED ON 5 DAY - SINGLE SHIFT

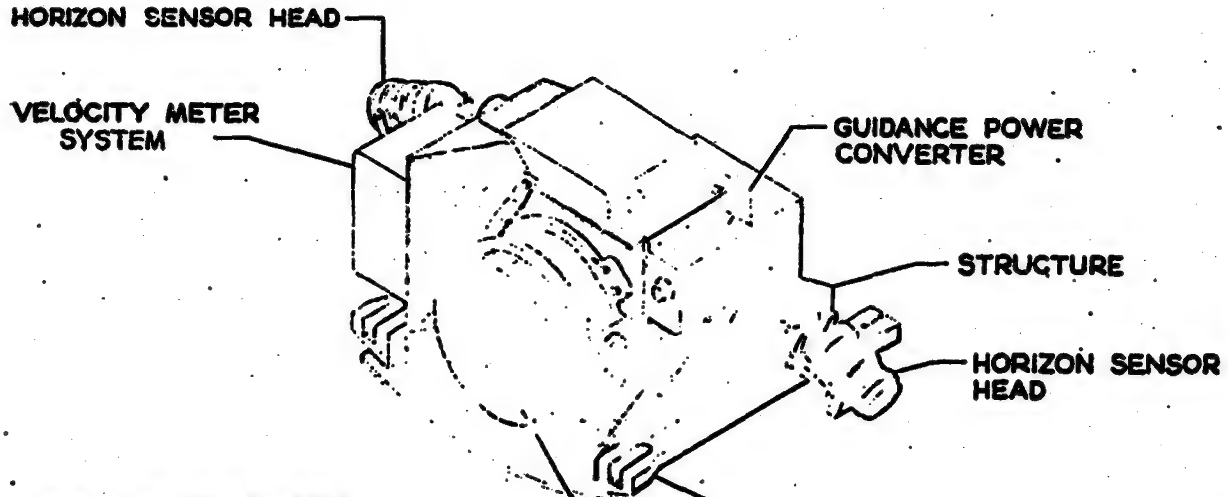
BASIC VEHICLE



STANDARD AGENA

GUIDANCE MODULE (PRESENT)

BASIC

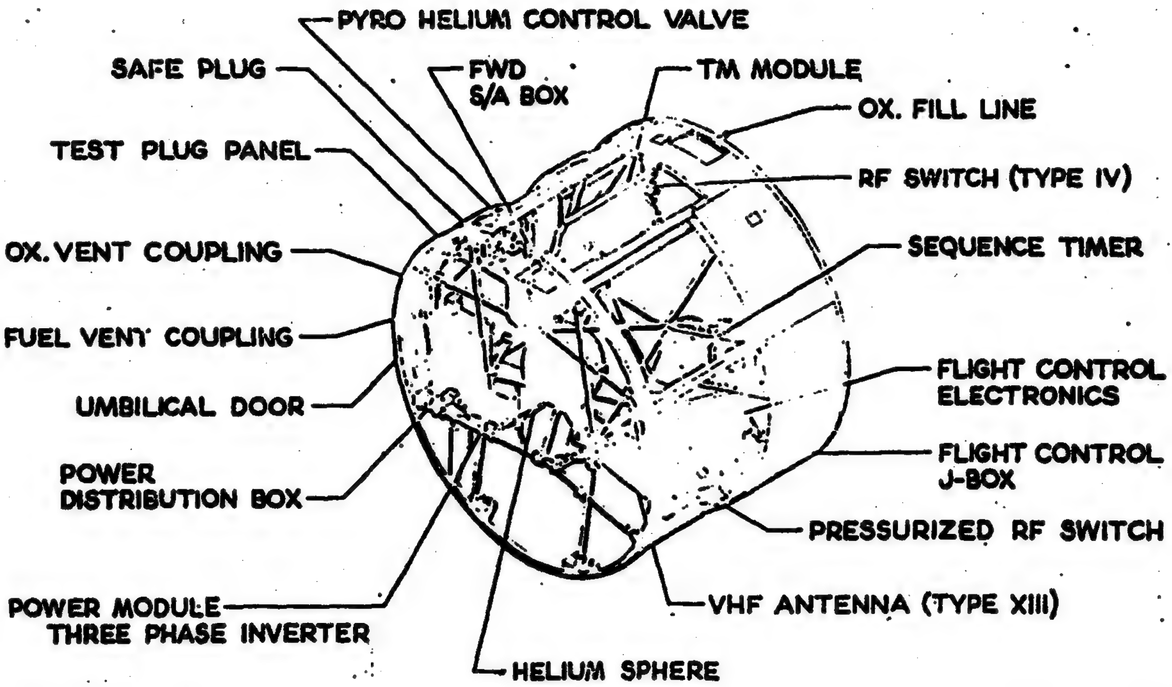


NOTE: FOR AD 210 - 4773
THIS MODULE CONSISTS OF PACS AND RACS (OPTIONAL) WHICH IS THE DUAL ATTITUDE CONTROL SYSTEM (DACS)

[illegible]

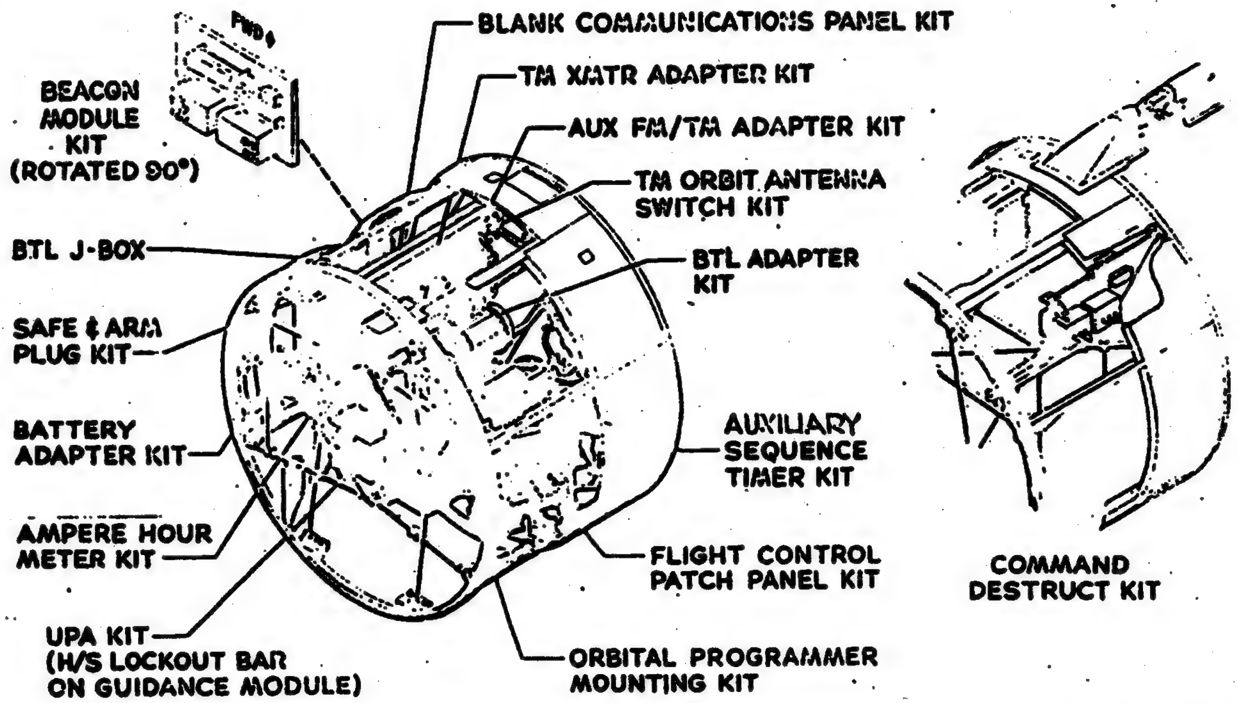
FORWARD SECTION

BASIC



FORWARD SECTION

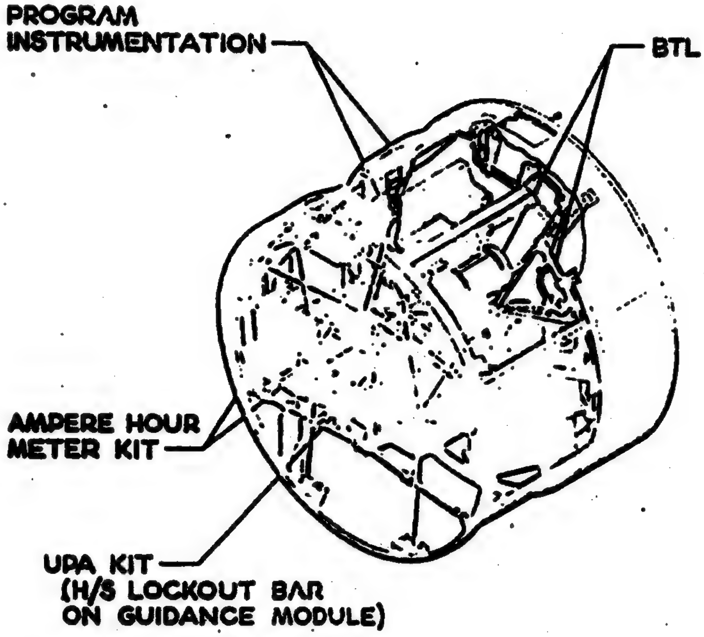
OPTIONALS

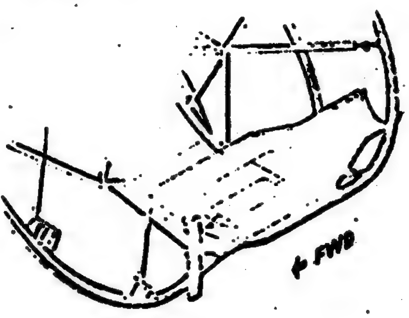

BLANK COMMUNICATIONS PANEL KIT
TM XMTR ADAPTER KIT
AUX FM/TM ADAPTER KIT
TM ORBIT ANTENNA SWITCH KIT
BTL ADAPTER KIT
FWD
BEACON MODULE KIT (ROTATED 90°)
BTL J-BOX
SAFE & ARM PLUG KIT
BATTERY ADAPTER KIT
AMPERE HOUR METER KIT
UPA KIT (H/S LOCKOUT BAR ON GUIDANCE MODULE)
AUXILIARY SEQUENCE TIMER KIT
FLIGHT CONTROL PATCH PANEL KIT
ORBITAL PROGRAMMER MOUNTING KIT
COMMAND DESTRUCT KIT

UNCLASSIFIED

FORWARD SECTION

USING PROGRAM ADDITIONS–STANDARD AGENA INSTALLED





BTL ANTENNA INSTALLATION

UNCLASSIFIED

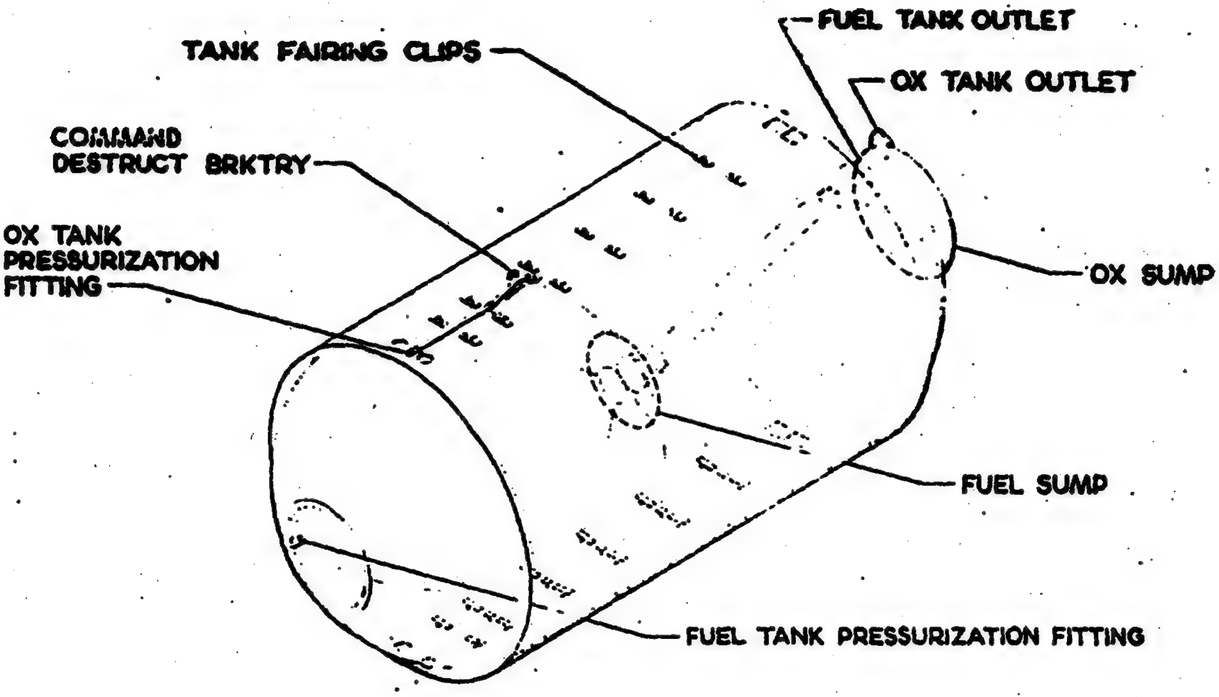
STD. AGENA FWD RACK

* MODEL 1191

OPTIONAL KITS

NOMENCLATURE	[redacted]	[redacted]	[redacted]	[redacted]
F/C PATCH PANEL	[redacted]	[redacted]	[redacted]	[redacted]
S-BAND BEACON/DECODER ADAPT.	[redacted]	[redacted]	[redacted]	[redacted]
C-BAND BEACON ADAPTER	[redacted]	[redacted]	[redacted]	[redacted]
BATTERY ADAPT. - I C	[redacted]	[redacted]	[redacted]	[redacted]
IV	[redacted]	[redacted]	[redacted]	[redacted]
VI A	[redacted]	[redacted]	[redacted]	[redacted]
SENSOR BAR PIN PULLER.	[redacted]	[redacted]	[redacted]	[redacted]
COMMAND DESTRUCT.	[redacted]	[redacted]	[redacted]	[redacted]
ORBITAL PROG. ADAPT.	[redacted]	[redacted]	[redacted]	[redacted]
TM TRANS. 2W ADAPT.	[redacted]	[redacted]	[redacted]	[redacted]
TM TRANS. 10W ADAPT.	[redacted]	[redacted]	[redacted]	[redacted]
AUX FM/TM ADAPT. (TYPE V)	[redacted]	[redacted]	[redacted]	[redacted]
SAFE/ARM PLUG	[redacted]	[redacted]	[redacted]	[redacted]
BEACON ANTENNA C/O COVER	[redacted]	[redacted]	[redacted]	[redacted]
SEQUENCE TIMER	[redacted]	[redacted]	[redacted]	[redacted]
HORIZON SENSOR PRE-AMP. SIGNAL COND.	[redacted]	[redacted]	[redacted]	[redacted]
* UPA	[redacted]	[redacted]	[redacted]	[redacted]
BLANK COMM. PANEL	[redacted]	[redacted]	[redacted]	[redacted]
* BTL	[redacted]	[redacted]	[redacted]	[redacted]
* AMP. HOUR METER	[redacted]	[redacted]	[redacted]	[redacted]

TANK SECTION



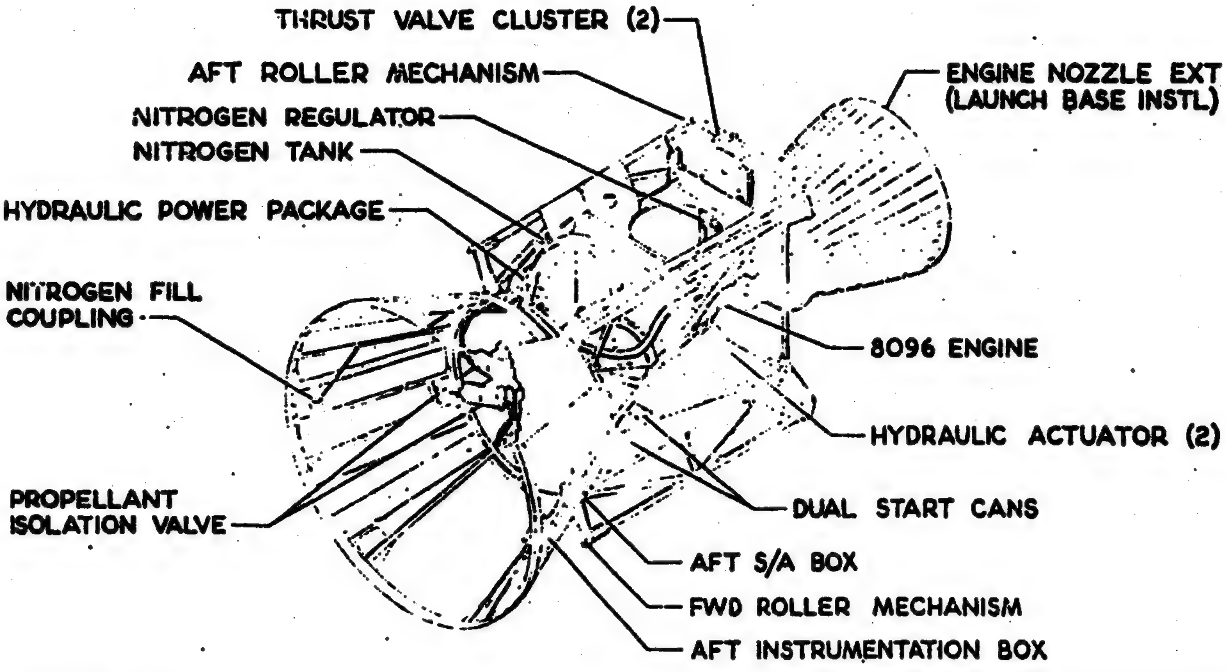
LMSC-A637528 3-6-64

UNCLASSIFIED

UNCLASSIFIED

AFT SECTION

BASIC VEHICLE



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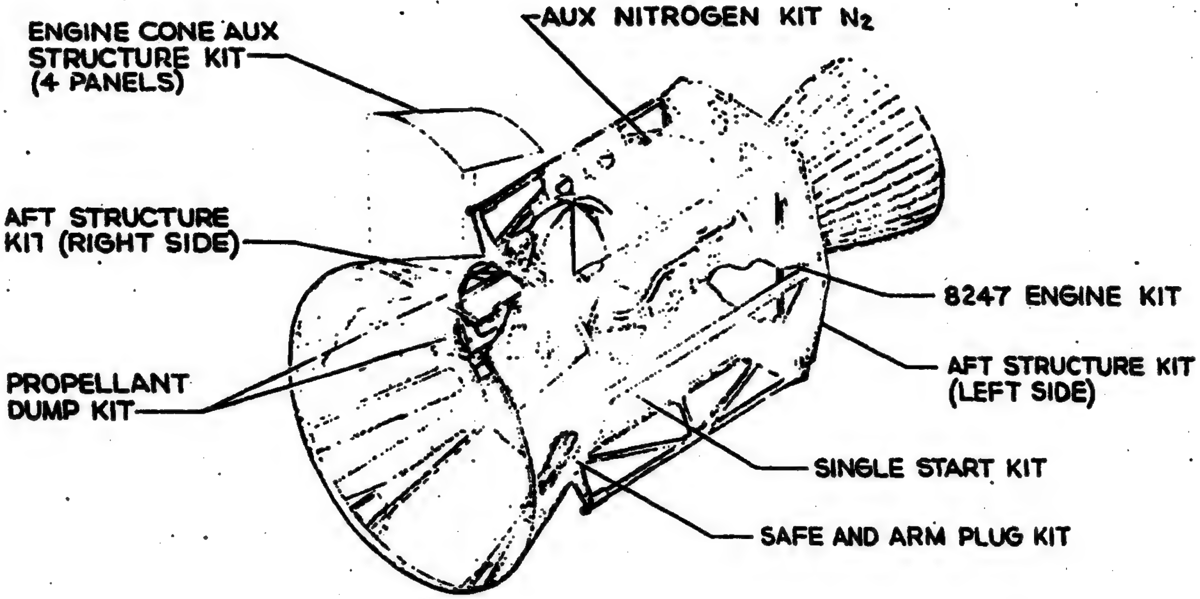
AFT SECTION

WITH OPTIONALS



AUX NITROGEN KIT N_2
ENGINE CONE AUX STRUCTURE KIT (4 PANELS)
AFT STRUCTURE KIT (RIGHT SIDE)
8247 ENGINE KIT
AFT STRUCTURE KIT (LEFT SIDE)
PROPELLANT DUMP KIT
SINGLE START KIT
SAFE AND ARM PLUG KIT

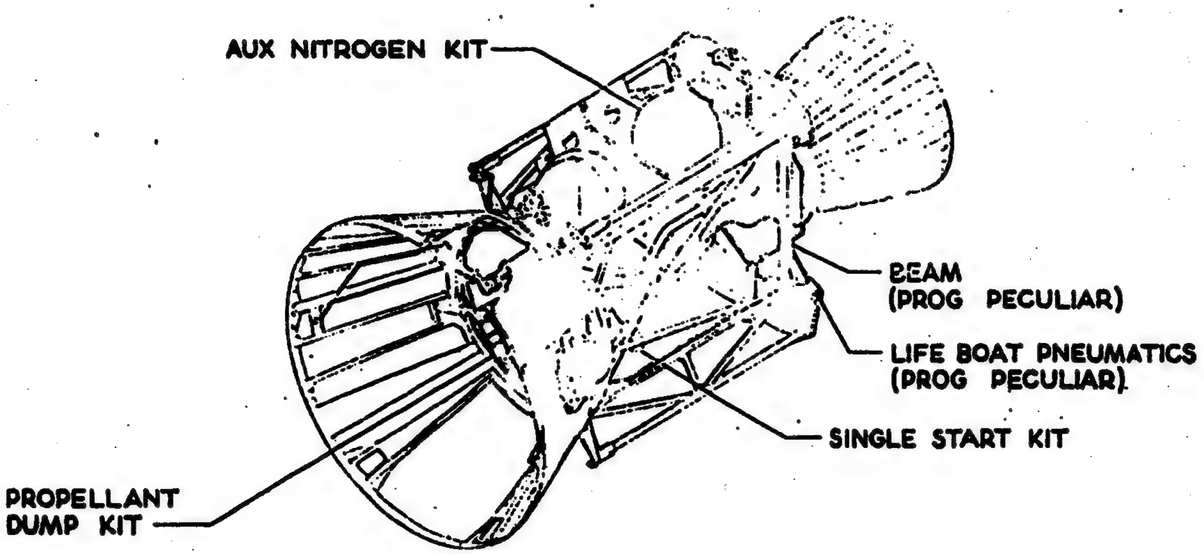
LMSC-A637526 3-6-64

UNCLASSIFIED

LOCKHEED MISSILES & SPACE COMPANY

AFT SECTION

USING PROGRAM ADDITIONS-STANDARD AGENA INSTALLED



STD. AGENA AFT RACK

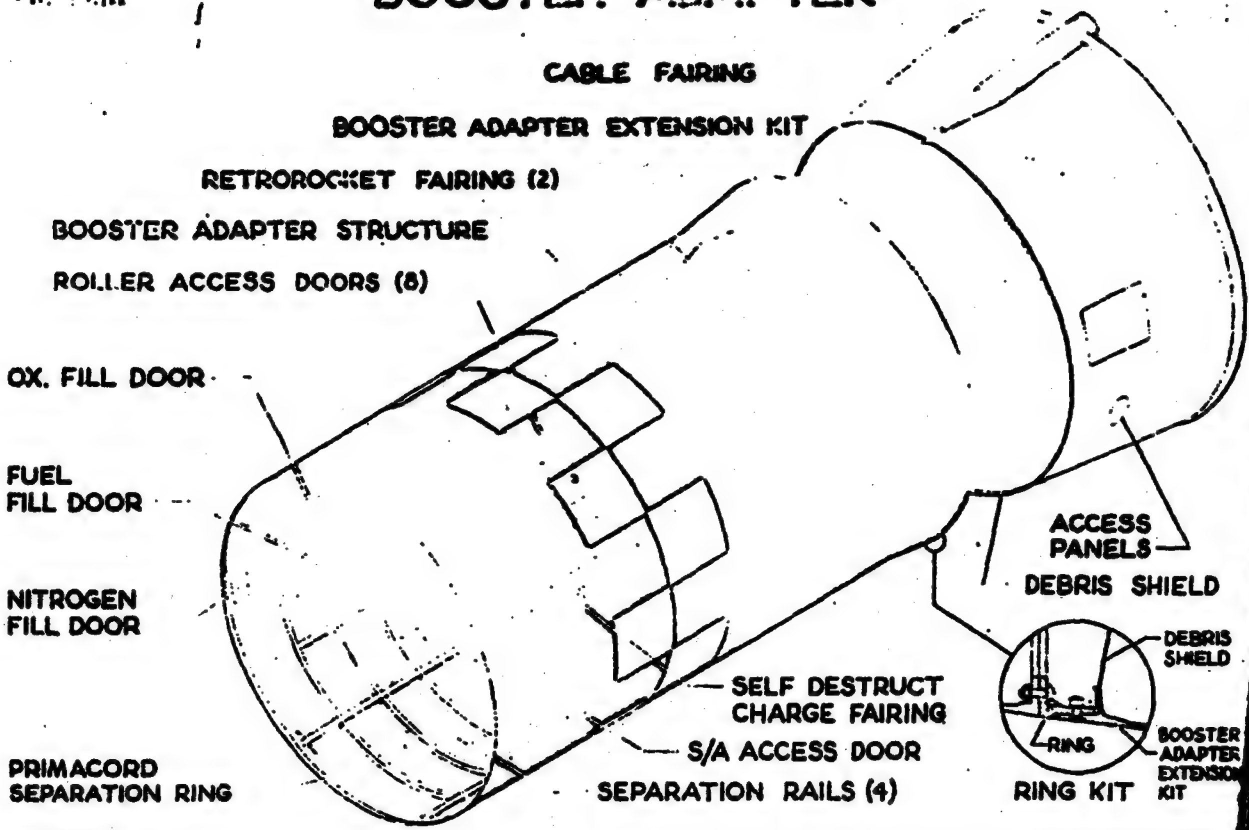
OPTIONAL KITS

NOMENCLATURE	[redacted]	[redacted]	[redacted]	[redacted]
BOOSTER ADAPTER EXT.	[redacted]	[redacted]	[redacted]	
BOOSTER ADAPTER EXT. RING	[redacted]	[redacted]	[redacted]	
ENGINE CONE AUX. STRUCT.	[redacted]	[redacted]	[redacted]	
* SINGLE START	[redacted]	[redacted]	[redacted]	
* PROPELLANT DUMP	[redacted]	[redacted]	[redacted]	
* AUX. N_2 TANK	[redacted]	[redacted]	[redacted]	
AFT STRUC. LEFT HAND	[redacted]	[redacted]	[redacted]	
AFT STRUC. RIGHT HAND	[redacted]	[redacted]	[redacted]	
THIRD NITROGEN TANK	[redacted]	[redacted]	[redacted]	
BOOSTER ADAPTER (.160)	[redacted]	[redacted]	[redacted]	
MAXIMUM ACCESS BOOSTER ADAPTER (MABA)	[redacted]	[redacted]	[redacted]	

* MODEL 1191

UNCLASSIFIED

BOOSTER ADAPTER



LMSC-A837530 3-6-64

UNCLASSIFIED

CONFIGURATION MANAGEMENT
STANDARD AGENA PROGRAM

CONTRACT SPECIFICATION COMPARISION

PROGRAM	~CONTRACT SPECS	375-1 ON CONTRACT
[redacted]	2000	YES
[redacted]	9	YES (RELAXED)
[redacted]	1	YES (RELAXED)
[redacted]	1	NO
[redacted]	1	NO
[redacted]	40	YES

AGENA COMPLIANCE DOCUMENTS

- ~ 2000 SPECS ON CONTRACT
  - INCLUDES 208 MAJOR ASSEMBLIES, BLACK BOXES, & HARNESSES
  - PLUS ELECTRONIC PIECE PARTS
    LOCKHEED CORP. PROCESS SPECS
    MILITARY SPECS.
- ~ 1650 DRAWINGS ON CONTRACT
- ANY SPEC. CHANGE OR NON-CONFORMANCE REQUIRES CLASS I ECP
  - INVOLVES EJA, WAIVER OR USCN, AFPRO REVIEW, AFSSD APPROVAL & CCN.
- ALL CLASS I DWG. CHANGES REQUIRE ECP & CCN
- ALL CLASS II DWG. CHANGES REQUIRE AFPRO ENG. APPROVAL
  - NOT REQUIRED BY ANA 445 OR OTHER PROGRAMS
- NON-CONFORMANCE TO ANY DWG. IS SUBJECT TO CLASS I (ECP/CCN)

HISTORY - 1966 - ~ 168 ECP'S PLUS 34 WAIVERS FOR DET. NON-COMPL.

CURRENT EX: NASA SPECS - 1 YEAR TO CONVERT - 115 TO STD AGENA

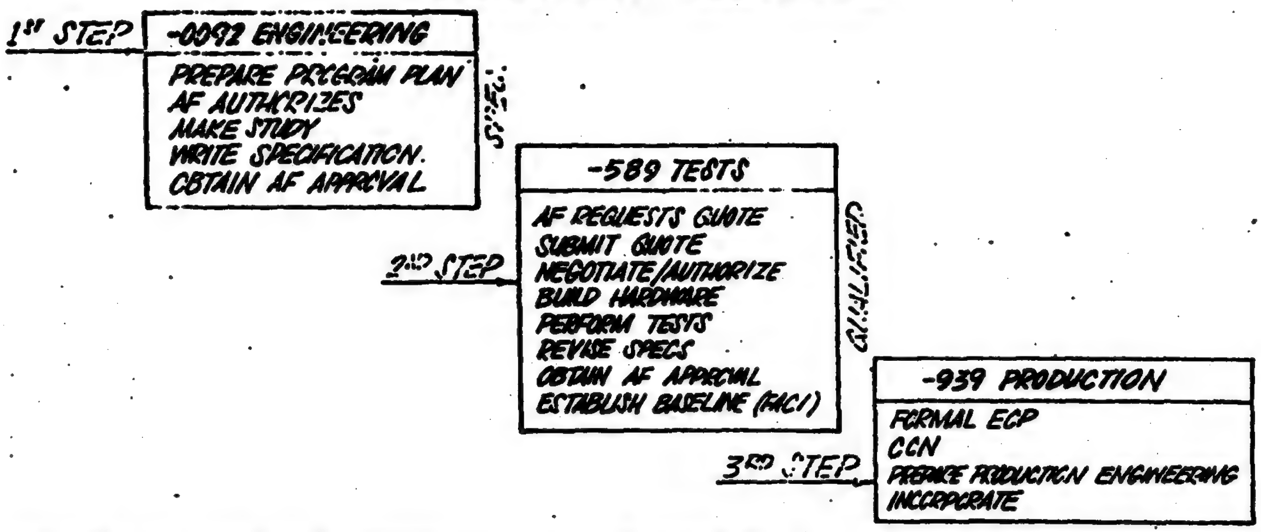
RESULT: A MAJOR FACTOR IN AGENA SLOW RESPONSE & COST

AGENA CONFIG. MGM'T/SPEC. PROPOSAL

- COMMON AGENA & USING PROGRAM GRD. RULES
- WRITE 375-1 INTERPRETATION EXHIBITS FOR CONTRACT -
- WRITE MODEL SPEC. FOR EACH CUSTOMIZED PROG. ~ 4
  846, 110, 770, & STD. CONFIG. ...
- REDUCE NUMBER FROM 2000 TO ~17 PER MODEL
- SCRUB THE REMAINING 17
  - REMOVE AMBIGUITIES, REDUNDANCIES, ADD CRITICAL MATERIAL FROM SUB-TIERS, IF ANY
- RELAX SPEC. & DWG. NON-CONFORMANCE INTERPRETATION - BY AFPRO PER SPO DIRECTION.
- ELIMINATE AFPRO CLASS II ENG. APPROVAL

AGENA CONTRACT STRUCTURE

DEVELOPMENT SEQUENCE



1st STEP

-0092 ENGINEERING

- PREPARE PROGRAM PLAN
- AF AUTHORIZES
- MAKE STUDY
- WRITE SPECIFICATION.
- OBTAIN AF APPROVAL

SPEC.

2ND STEP

-589 TESTS

- AF REQUESTS QUOTE
- SUBMIT QUOTE
- NEGOTIATE/AUTHORIZE
- BUILD HARDWARE
- PERFORM TESTS
- REVISE SPECS
- OBTAIN AF APPROVAL
- ESTABLISH BASELINE (FACI)

QUALIFIED

3RD STEP

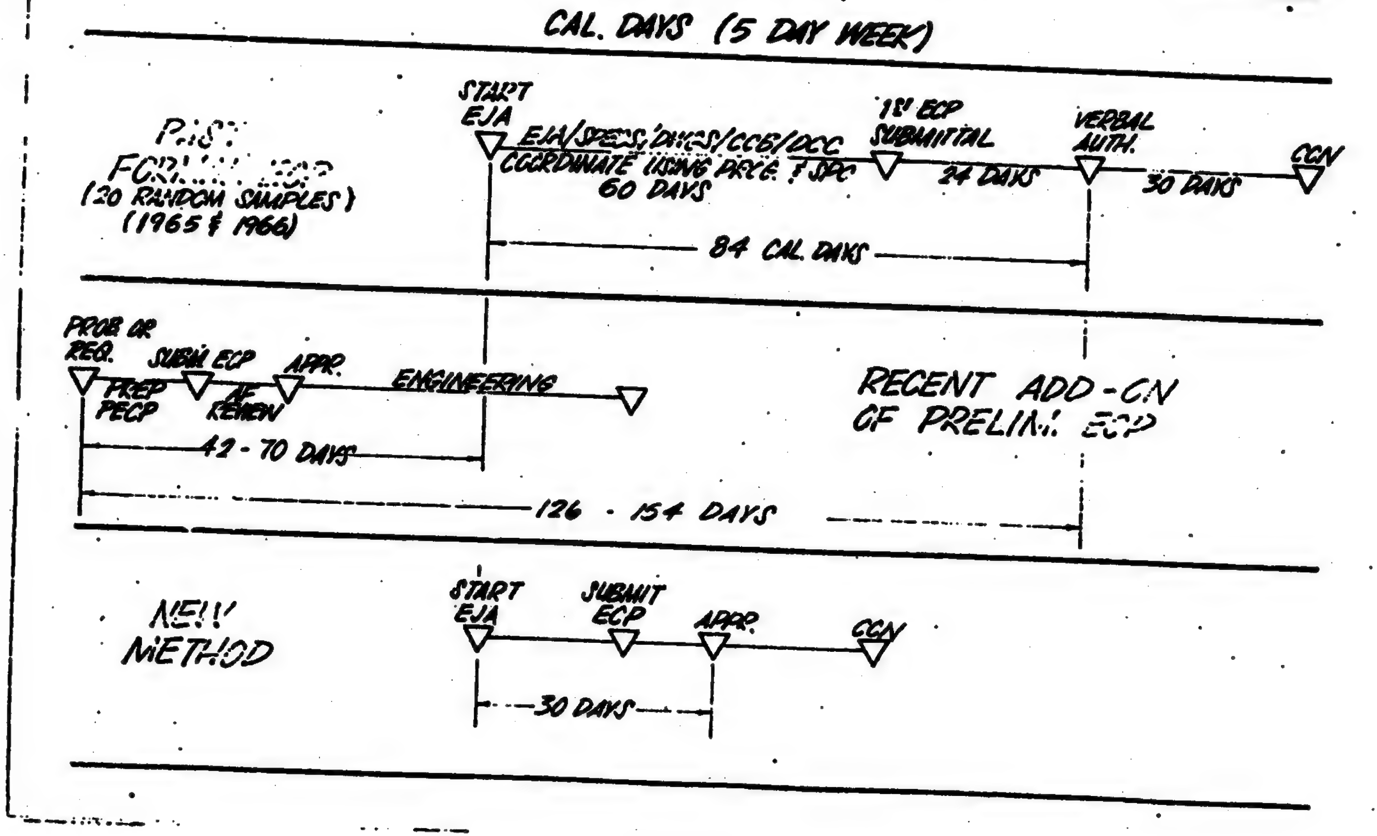
-939 PRODUCTION

- FORMAL ECP
- CCN
- PREPARE PRODUCTION ENGINEERING
- INCORPORATE

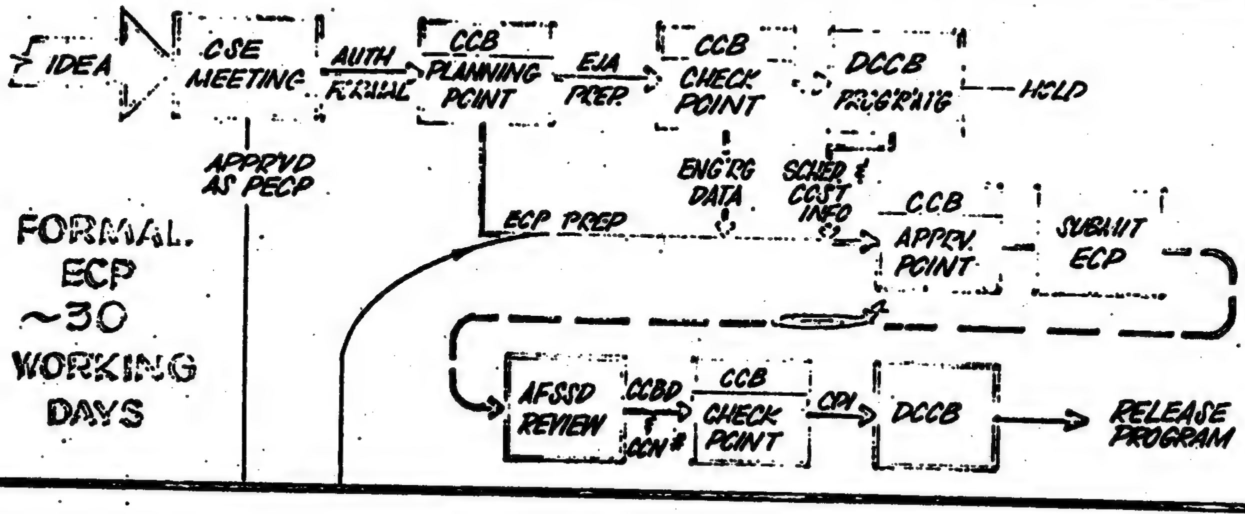
EXAMPLES: DC/DC CONVERTER ____________ INCORPORATE AD 143
486 DAYS

FILL/VENT COUPLING ____________ INCORPORATE AD 205
730 DAYS

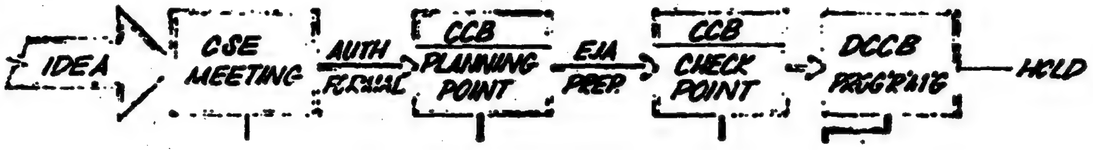
AGENA CHANGE CONTROL



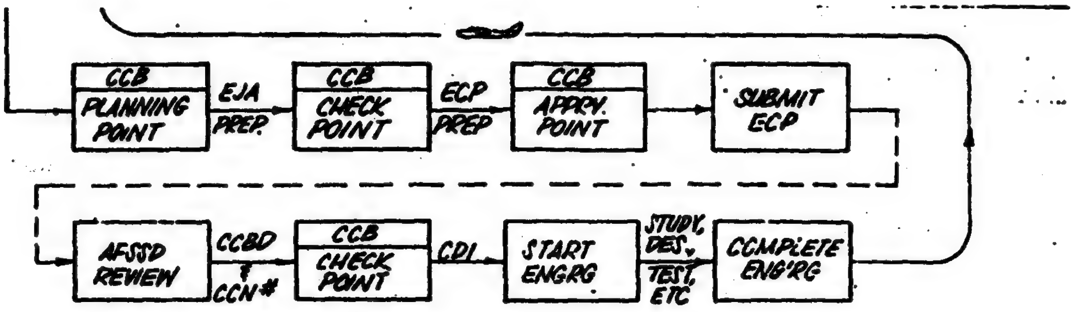
EJA/ECP/CCN FLOW CHART



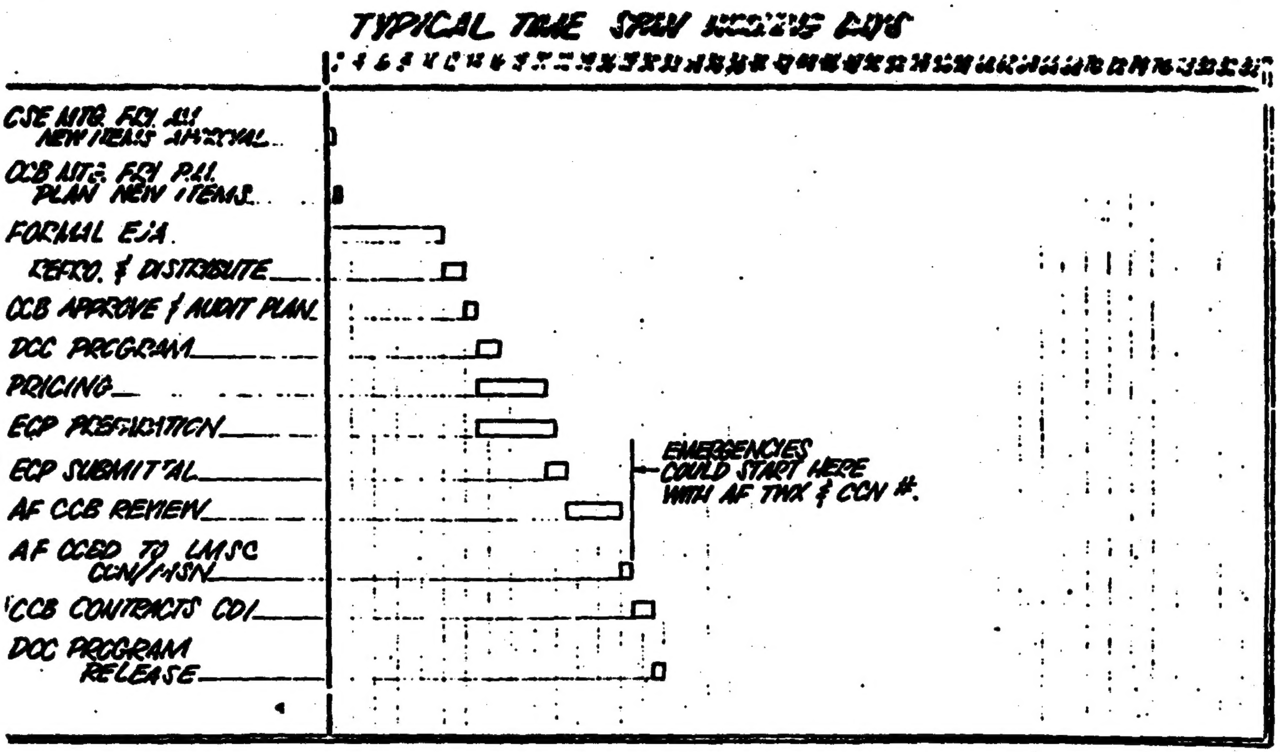
EJA/ECP/CCN FLOW CHART



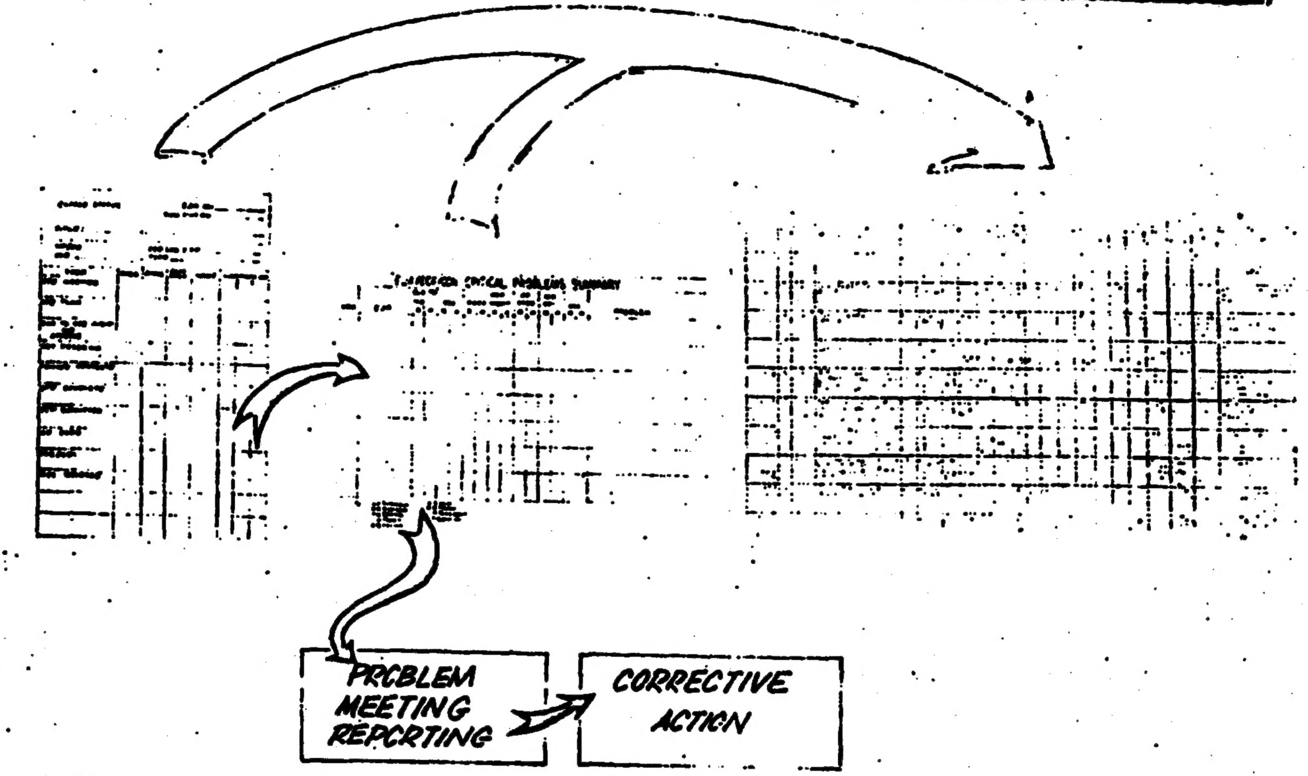
PREL. ECP
ADDS ~
53
WORKING
DAYS



FORMAL EJA/ECP/CCN CYCLE



EJA/ECP/CCN CONTROL PLAN



PROBLEM MEETING REPORTING

CORRECTIVE ACTION

CUSTOMIZED AGENA

PROGRAM OBJECTIVES

DEVELOP STANDARDIZED VEHICLE AVAILABLE FOR FLIGHT JUNE 1962

INCORPORATES

- HIGH RELIABILITY
- MISSION ADAPTABILITY
- MAINTAINABILITY
- SERVICEABILITY
- PRODUCIBILITY
- REDUCE CHECKOUT REQUIREMENTS
- IMPROVE PERFORMANCE
- REDUCE PRODUCTION COST

CREATE A CAPABILITY FOR PRODUCTION AT 5/MONTH (FIXED PRICE CONTRACT)

DEVELOP AND MAINTAIN STREAMLINED PROCEDURES AND ORGANIZATION FOR FAST REACTION AND LOW COST